ANNUAL OPERATIONS REPORT – 2007/8
DUNN FIELD SOURCE AREAS
FLUVIAL SOIL VAPOR EXTRACTION SYSTEM
YEAR ONE

Defense Depot Memphis, Tennessee

Defense Logistics Agency

Solutions Today for a Sustainable Tomorrow

Air Force Center for Engineering and the Environment
Contract No. FA8903-04-D-8722
Task Order No. 0031

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Prepared for:

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Prepared by:

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LIST OF ACRONYMS AND ABBREVIATIONS

1,2-DCE	total 1,2-dichloroethene
acfm	actual cubic feet per minute
AFCEE	Air Force Center for Engineering and the Environment
bgs	below ground surface
BRAC	Base Realignment and Closure
BCT	BRAC Cleanup Team
CF	Chloroform
CT	Carbon tetrachloride
CVOCs	Chlorinated Volatile Organic Compounds
CWM	chemical warfare material
DCA	1,2-dichloroethane
DCE	1,1-Dichloroethene
DDMT	Defense Depot Memphis, Tennessee
DLA	Defense Logistics Agency
DoD	Department of Defense
DQE	Data quality evaluation
DQO	Data quality objectives
e^2M	engineering-environmental Management, Inc.
ET&D	excavation, transportation, and offsite disposal
FSVE	Fluvial Soil Vapor Extraction
GAC	granular activated carbon
GC/MS	Gas Chromatography/Mass Spectrometry
hp	horsepower
in. Hg.	inches of mercury
IRA	Interim Remedial Action
MDL	method detection limit
MI	Main Installation
ml/min	milliliters per minute
msl	mean seal level
O&M	Operation and maintenance
PCA	1,1,2,2-Tetrachloroethane
PID	photoionization detector
POL	petroleum/oil/lubricants

ppbv	parts per billion by volume
QC	Quality control
RI	remedial investigation
RG	remedial goals
RL	Reporting Limit
ROD	Record of Decision
ROI	radius of influence
RW	Recovery Well
scfm	standard cubic feet per minute
SVE	soil vapor extraction
TCA	1,1,2-Trichloethane
TCE	Trichloroethene
tDCE	trans-1,2-Dichloroethene
TeCA	1,1,2,2 tetrachloroethane
TSVE	Thermal Soil Vapor Extraction
EPA	United States Environmental Protection Agency
µg/L	Micrograms per liter
VC	Vinyl Chloride
VMP	vapor monitoring point
VOCs	Volatile organic compounds

1.0 INTRODUCTION

engineering-environmental Management, Inc (e^2M) has prepared this Annual Operations Report for the Fluvial Soil Vapor Extraction System (FSVE) System under Contract FA8903-04-D-8722, Task Order 31 to the Air Force Center for Engineering and the Environment (AFCEE). This report summarizes the operations and maintenance activities for the FSVE system and the results of system monitoring for the first year of FSVE operations on Dunn Field at the Defense Depot Memphis, Tennessee (DDMT). The report covers operations from start-up (25 July 2007) through 1 August 2008 (Year One).

1.1 SITE DESCRIPTION AND BACKGROUND

DDMT, which originated as a military facility in the early 1940s, received, warehoused, and distributed supplies common to all U.S. military services and some civil agencies located primarily in the southeastern United States, Puerto Rico, and Panama. Stocked items included food, clothing, petroleum products, construction materials, and industrial, medical, and general supplies. In 1995, DDMT was placed on the list of the Department of Defense (DoD) facilities to be closed under Base Realignment and Closure (BRAC). Storage and distribution of material continued until the facility closed in September 1997.

DDMT is located in southeastern Memphis, Shelby County, Tennessee approximately five miles east of the Mississippi River and just northeast of Interstate 240. The property consists of approximately 642 acres and includes the Main Installation (MI) and Dunn Field. The MI contains approximately 578 acres with open storage areas, warehouses, military family housing, and outdoor recreational areas. Dunn Field contains approximately 64 acres and includes former mineral storage and waste disposal areas. Dunn Field is located across Dunn Avenue from the north-northwest portion of the MI.

In 1992, DDMT was added to the National Priorities List. The lead agency for environmental restoration activities at DDMT is the Defense Logistics Agency (DLA). The regulatory oversight agencies are the United States Environmental Protection Agency Region 4 (EPA) and the Tennessee Department of Environmental Conservation. DDMT's EPA Identification Number is TN4210020570.

1.2 SITE GEOLOGY AND HYDROGEOLOGY

The geologic units of interest at DDMT are (from youngest to oldest): loess, including surface soil; fluvial deposits; Jackson Formation/Upper Claiborne Group; and Memphis Sand.

The Quaternary-aged loess consists of wind-blown deposits, brown to reddish-brown, low-plasticity clayey silt to silty clay. The loess deposits are about 20 to 30 feet thick and are continuous throughout the Dunn Field area.

The Quaternary and possibly Pliocene-aged fluvial (terrace) deposits consist of two general layers. The upper layer is a silty, sandy clay that transitions to a clayey sand and ranges from about 10 to 36 feet thick. The lower layer is composed of interlayered sand, sandy gravel, and gravelly sand, and has an average thickness of approximately 40 feet.

The late Eocene-aged Jackson Formation/Upper Claiborne Group consists of clays, silts, and sands. The upper clay unit appears to be continuous except in the southwestern area of Dunn Field. Offsite, to the west and northwest of Dunn Field, there are possible gaps in the clay. Where present, these gaps possibly create connections to the underlying intermediate aquifer from the fluvial deposits.

The Early to Middle Eocene-aged Memphis Sand is composed primarily of thick-bedded, white to brown or gray, very fined-grained to gravelly, partly argillaceous and micaceous sand. Lignitic clay beds constitute a small percentage of the total thickness. Regionally, the Memphis Sand ranges from 500 to 890 feet in thickness and is at a depth of approximately 120 to 300 feet below ground surface (bgs). The only monitoring well completed in the Memphis Sand at DDMT is MW-67. The top of the Memphis Sand was identified at a depth of 255 feet bgs (elevation of 21 feet above mean sea level [msl]).

Three aquifers of interest underlying Dunn Field correspond to the geologic units described previously. The uppermost aquifer is the unconfined fluvial aquifer, which consists of saturated sands and gravelly sands in the lower portion of the fluvial deposits. Recharge is primarily from rainfall infiltration. Discharge is generally directed toward underlying units in hydraulic communication with the fluvial deposits or laterally into adjacent stream channels. The saturated thickness near Dunn Field ranges from 1 to 50 feet and is controlled by the uppermost clay configuration in the Jackson formation/Upper Claiborne group. Water level elevations range from approximately 260 feet msl northeast of Dunn Field to 200 feet msl southwest of Dunn Field.

The intermediate aquifer is locally developed in deposits of the Jackson formation/Upper Claiborne group deposits, which contain laterally extensive, thick clay deposits. Water level elevations in the intermediate aquifer, away from areas of recharge from the fluvial aquifer, are approximately 160 feet msl.

The Memphis aquifer contains groundwater under strong artesian (confined) conditions regionally. The City of Memphis obtains the majority of its drinking water from this unit; the Allen Well Field is located

approximately 2 miles west of Dunn Field. The Memphis aquifer is confined by overlying clays and silts in the Cook Mountain Formation (part of the Jackson/Upper Claiborne Group). This aquifer receives most of its recharge from an outcrop area several miles east of Memphis. Some recharge is derived from overlying or hydraulically communicating units. The top of the Memphis aquifer potentiometric surface at MW-67 is approximately 165 feet msl.

1.3 NATURE AND EXTENT OF CONTAMINATION

Historical information concerning disposal sites at Dunn Field is included in the *Memphis Depot Dunn Field Remedial Investigation Report – Volumes I thorough III* (CH2M HILL, 2002). Records indicate that chemical warfare material (CWM), chlorinated lime, super tropical bleach, and calcium hypochlorite, food stocks, paints/thinners, petroleum/oil/lubricants (POL), acids herbicides, mixed chemicals, and medical wastes were reportedly destroyed or buried in pits and trenches at the Dunn Field disposal sites.

1.3.1 Subsurface Soil Contamination

Subsurface soil samples collected in 1999 for the remedial investigation (RI) showed significant levels of CVOCs in the loess; the primary CVOCs are 1,1,2,2 tetrachloroethane (TeCA); 1,2-dichloroethane (DCA); total 1,2-dichloroethene (1,2-DCE); carbon tetrachloride (CT); chloroform (CF); methylene chloride; tetrachloroethene (PCE); trichloroethene (TCE); and vinyl chloride. The highest concentrations detected were TCE at 460 milligrams per kilogram (mg/kg); TeCA at 160 mg/kg and 1,2-DCE at 190 mg/kg. Further soil sampling was conducted in October 2000 to February 2001 to delineate potential source areas. Sixteen soil borings were drilled to the top of the clay below the water table, approximately 80 to 95 bgs, and soil samples were collected from the loess and fluvial deposits. TCE and PCA were the CVOCs most frequently detected in soil samples at concentrations above the remedial goals; the highest concentrations within the fluvial deposits were PCA at 22.6 mg/kg and TCE at 0.888 mg/kg.

Soil samples were collected in May and June 2007 from the seven SVE well borings and the ten deep VMP borings at three depths, 8 feet, 18 feet and 28 feet below the bottom of the loess. Analytical results from the 51 soil samples were compared to the soil remediation goals (RGs). There were no exceedances in samples from three borings (SVE-A, VP-01 and SVE-E). In the other borings, RGs were exceeded for TeCA with a maximum concentration of 17 mg/kg; for TCE with a maximum concentration of 0.67 mg/kg; for TCA with a maximum concentration of 0.095 mg/kg; and for CF in 1 sample at a concentration of 0.55 mg/kg. Based on the analytical results and an 80-foot radius of influence (ROI) for the SVE wells, the estimated CVOC mass in the fluvial soils at Dunn Field is 979 pounds.

1.3.2 Groundwater Contamination

The nature and extent of contamination in groundwater underlying Dunn Field were assessed during the RI based on chemical analyses of groundwater samples collected since January 1996. Only CVOCs were determined to require remedial action for subsurface soils and groundwater. A groundwater extraction system consisting of seven recovery wells was installed along the western Dunn Field boundary as an interim remedial action and began operation in November 1998. An expanded system with eleven recovery wells began operation in 2000. Groundwater samples have been collected regularly since 1999 to evaluate system effectiveness in restricting plume migration. Samples were collected quarterly in 1999 and 2000 and have been collected semiannually since 2002; limited sampling was performed in 2001.

The Dunn Field ROD (CH2M HILL, 2004) identified three primary contaminant plumes in the fluvial aquifer underlying Dunn Field. Mixing and intermingling of the plumes have occurred due to the active groundwater extraction system and natural groundwater flow. The highest groundwater contaminant concentrations have been detected in the central plume. The individual VOCs with the highest concentrations are PCA and TCE, with maximum concentrations up to 40,800 micrograms per liter (µg/L) for PCA and 7,100 µg/L for TCE (MW-73, 22 October 2003).

From system startup in 1998 through December 2008, the extraction system has pumped over 312 million gallons of groundwater from the fluvial aquifer and discharged the groundwater to the City of Memphis publically owned treatment works. Also through December 2008, approximately 918 pounds of CVOCs were removed, including 369 pounds of TCE (e^2M, 2009). All recovery wells (RWs) are currently offline. Groundwater sample results from the April 2008 IRA semiannual monitoring event demonstrated that the Source Areas RA was having a significant impact in reducing CVOC concentrations in groundwater. CVOC concentrations in RWs and MWs at the north end of Dunn Field did not exceed 50 µg/L for any single CVOC. Operation of RW-5 through RW-9 was discontinued on 9 June 2008. CVOC concentrations in groundwater samples from the October 2008 semiannual monitoring event decreased or remained at low levels and the on-line RWs (RW-1, RW-1A, RW-1B, RW-2, RW-3, and RW-4) were shutdown on 23 January 2009.

1.4 SOURCE AREAS REMEDIAL ACTION

The *Memphis Depot Dunn Field Source Areas Final Remedial Design* (RD) (CH2M HILL, 2007) was approved by EPA on 20 March 2007 and by TDEC on 23 March 2007. The approved Source Areas RD included the following components:

- Use of thermal-enhanced and conventional SVE to remove CVOCs from subsurface soil to levels that are protective of the intended land use and groundwater.
- Excavation, transportation, and offsite disposal (ET&D) of VOC-impacted soil from two small areas in the Disposal Area.
- Injection of ZVI to remediate CVOCs in groundwater beneath onsite vadose zone source areas.
- Implementation and enforcement of land and groundwater use controls in accordance with the Dunn Field LUCIP.

The BRAC Cleanup Team (BCT) agreed to expedite implementation of the SVE component in the deeper, coarse-grained fluvial soils while the remedy for the shallow subsurface soil (loess) was reviewed. The *Dunn Field Source Areas Fluvial Soil Vapor Extraction Remedial Action Work Plan, Rev.1* (FSVE RAWP) (e²M, 2007) was approved by EPA on 3 July 2007.

1.5 FLUVIAL SVE SYSTEM DESCRIPTION

The FSVE system was installed to remediate chlorinated volatile organic compound (CVOC) soil impacts in the fluvial sands beneath Dunn Field. The system was constructed from April through July 2007 and consists of two 13.1 horsepower (hp) regenerative blowers connected to seven wells screened at depths of 32 to 66 feet below ground surface. The blowers provide a vacuum to the subsurface and remove soil vapor containing CVOCs from the seven SVE wells. The vapor travels through individual conveyance lines to the system compound. Condensate from the SVE extracted vapor is removed via a 140-gallon air/water separator and stored in a 535-gallon tank for analysis prior to discharge to the City of Memphis sewer system. When required, the extracted air flows through two 2,000-pound granular activated carbon (GAC) vessels prior to discharge to the atmosphere. There are 20 vapor monitoring points (VMPs) located 15 to 80 feet from the SVE wells to monitor vacuum influence from the SVE wells and CVOC concentrations in the subsurface vapor.

Fluvial SVE operations began on 25 July 2007. The system is currently operated with all SVE wells in the 100% open position. No emission controls are currently being used and extracted vapor is being emitted directly to the atmosphere. The Fluvial SVE system is shown on Figure 1-1.

1.6 SCOPE OF WORK

e^2M has performed operation and maintenance (O&M) activities for the FSVE system since system startup on 25 July 2007. The goals for O&M are to:

- Maintain system operations through regular field inspections, maintenance, and repairs; and
- Monitor system effectiveness through vapor flow rates, vacuum measurements, and photoionization detector (PID) measurements, and the analysis of laboratory samples from individual SVE wells, system influent and effluent, and VMPs.

The following sections briefly describe the field activities performed to support these objectives. O&M activities follow procedures described in the *Dunn Field Source Areas Fluvial Soil Vapor Extraction System Operations and Maintenance Manual* (FSVE O&M Manual) (e^2M, Inc., 2008).

The scope for FSVE operations included the following activities:

- Weekly system inspections with repair or replacement of components, as required;
- Weekly collection of system readings including flow rates, vacuums and pressures, temperatures, and readings from hour meters;
- Weekly collection of PID readings from SVE wells and system effluent and influent;
- Monthly collection of vacuum readings from VMPs;
- Quarterly collection of PID readings from VMPs;
- Quarterly collection of laboratory samples from SVE wells and system influent and effluent analyzed for VOCs;
- Periodic collection of laboratory samples from VMPs;
- Collection of laboratory samples from SVE condensate as needed for disposal. Results were submitted to the City of Memphis and with approval, the condensate was discharged through the IRA discharge line to the City of Memphis POTW; and
- Quarterly Operations Reports to document O&M activities, system status, and performance, to report quarterly laboratory samples, and provide recommendations for future operations.

2.0 SYSTEM OPERATIONS ACTIVITIES

System O&M requirements were evaluated during weekly visits of the FSVE system throughout Year 1 operations. Observations and system data were summarized in quarterly memoranda.

2.1 SYSTEM PERFORMANCE

FSVE system operations began on 25 July 2007 with both blowers in operation and system emissions treated with GAC prior to discharge to atmosphere. The system was shut down on 1 August 2007 due to higher than expected mass extraction rates that exceeded the adsorption capacity of the GAC treatment system. The GAC was replaced and the system restarted on 13 August 2007. System uptime was further affected the first several months of operations by overheating and electrical issues associated with the SVE blowers. Uptime percentages by month and a brief description of downtimes are summarized below.

- July 2007 – 63.2% uptime. Downtime was for replacement of thermal breaker (in control panel).
- August 2007 – 44% uptime. System was offline from 1 to 13 August awaiting GAC change-out. Additional downtime due to installation of heavier gauge wiring from the panel to the blowers and for routine maintenance.
- September 2007 – 97.1% uptime. Downtime for routine maintenance.
- October 2007 – 91.9% uptime. Downtime due to high amperage at the SVE blowers, routine maintenance, and 4Q07 sampling event.
- November 2007 – 96.8% uptime. Downtime due to high amperage at the SVE blowers and for routine maintenance.
- December 2007 – 96.7% uptime. Downtime for routine maintenance and replacement of SVE blower.
- January 2008 – 97.6% uptime. Downtime for routine maintenance and 1Q08 sampling event.
- February 2008 – 97.1% uptime. Downtime for routine maintenance.
- March 2008 – 85.7% uptime. Downtime for rebound study, routine maintenance and replacement of SVE blower.
- April 2008 – 94.6% uptime. Downtime for rebound study, 2Q08 sampling event and routine maintenance.
- May 2008 – 99.9% uptime. Downtime for routine maintenance.
- June 2008 – 99.9% uptime. Downtime for routine maintenance.
- July 2007 – 96% uptime. Downtime for 3Q08 sampling event and routine maintenance.

2.2 SYSTEM FLOW RATES AND VACUUMS

System flow rates and vacuum measurements are shown on Table 2-1. Flow rates at individual wells are measured by a vane-type meter at the piping manifold. System flow rates are measured by a mass-flow meter. The system is generally operated with all SVE wells in the 100% open position. Individual flow rates vary from less than 20 to 200 actual cubic feet per minute (acfm) with both blowers in operations. Individual flow rates remained fairly constant over the operating year with the higher flow rates at SVE-B, SVE-C, SVE-D, SVE-E, and SVE-F. The lower flow rates and subsequently higher vacuums at SVE-A and SVE-G are attributed to those wells being screened in tighter soils than other SVE wells. Combined flow from all SVE wells is approximately 750 scfm standard cubic feet per minute (scfm) at 5.2 inches of mercury (in. Hg.) with both blowers operating. With a single blower in operation, system flow rates decrease to near 690 scfm at 2.5 in. Hg.

Vacuum measurements are collected at VMPs on a monthly basis during the operating year by connecting a vacuum gauge to the sealed cap of each VMP well casing. The measurements are shown on Table 2-2. Vacuum readings at several wells were affected by debris lodged in tubing during measurements collected in August and September 2007. Measurements indicate a vacuum influence at distances greater than 80 feet at all SVE wells.

2.3 REBOUND STUDY

Three SVE wells (SVE-B, SVE-E, and SVE-F) were offline for a four-week period (20 March to 18 April 2008) to evaluate contaminant rebound from wells that had declined to near or below RGs. The four other SVE wells remained online during the rebound study with both blowers in operation. Laboratory samples were collected from the three offline wells and associated VMPs (VMP-2A/B, VMP-6A/B, VMP-7A/B, and VMP-8A/B) at two weeks and four weeks into the shut down. The three SVE wells were brought back online on 18 April.

2.4 SYSTEM MAINTENANCE

System maintenance is performed weekly by e^2M personnel. Regular system maintenance includes the physical inspection of all major system components and piping for leaks, tears and/or signs of deterioration, cleaning (as necessary) of system components, and general housekeeping of the SVE compound. Routine maintenance activities were generally conducted during weekly system inspections and included the following activities:

- Visual inspection of all system components and piping to ensure equipment is free of cracks, rust spots, and/or corrosion.
- Inspection of flex hose for holes, tears, leaks, and other signs of deterioration. Ensure all connections are tight and secure.
- Cleaning of heater coils of HVAC system.
- Cleaning the exterior of AWS vessel of debris.
- Removal of accumulated water and debris from manifold including the cleaning of the site glass from flow meter.
- Cleaning and removal of dirt and debris from SVE building lovers.
- Inspecting GAC vessels and flex hosing for holes, tears, leaks and other signs of deterioration.
- Cleaning heat exchanger coil and cooling fins with water and degreasing agent mixture.

Major FSVE system maintenance activities from Year 1 operations are summarized below.

2.4.1 Granular Activated Carbon

The FSVE system was shutdown on 1 August 2007 after PID readings indicated the adsorption capacity of the GAC vessels had been exhausted. At shut down, 362 pounds of VOCs were estimated to have been removed from the fluvial deposits. The vessels were emptied and replenished with re-activated GAC and system restarted on 13 August 2007.

The FSVE system continued to operate with the GAC emissions treatment until early October 2007 when laboratory samples and PID readings indicated VOC system emissions (untreated) were below the Memphis/Shelby County Health Department (MSCHD) Operations Permit standard of 5.71 pounds per hour (lb/hr). On 5 October 2007, the GAC treatment system was taken offline and extracted vapor was emitted directly to the atmosphere. The vessels were emptied and replenished with fresh GAC on 26 December 2007 due to potential for higher VOC emissions following startup of the TSVE system in 2008. The system continues to operate without GAC treatment based on field readings and laboratory samples.

Following each change-out, samples of the spent GAC were collected for hazardous waste characterization. The spent GAC was transported offsite to the supplier, Calgon, for reactivation.

2.4.2 Blowers

Blower overheating and electrical shorting of motor wiring were cause for the majority of the system shut downs during Year 1. The primary problem was higher than expected system vacuum causing the blowers to run near the top of the blower performance curve. The high vacuum draws power at or near the maximum amperage rating of the blower motors and either trips the equipment's circuit at the panel or shorts out the blower motor wiring. The higher vacuum was caused by tighter than expected soils near some of the SVE wells. In most instances, the system was able to be restarted with a single blower in operation which allows the system to run at lower vacuum. The two blowers were replaced under manufacturer's warranty to ensure the issue was not equipment related.

The power from the local utility was investigated as the possible source of blower shut down. Voltage data loggers were installed at the system panel to monitor the power coming into the panel. Voltage swings or "dirty power" could cause the blowers to draw power (or amperage) exceeding the blower motor's rating. The data loggers tracked system voltage for a 72-hour period and no noticeable voltage swings were noted.

Although the blowers continue to operate at or near the blower performance curve, several measures were taken to minimize the effects of the higher vacuum and limit blower shutdowns. These included:

- Inspection of all wiring at panel and equipment by an electrician to ensure all wire connections were tight, and equipment and wiring were adequate for system operating conditions.
- Weekly inspection of blower wiring by field technicians to monitor wiring condition.
- Installing heavier gauge (#8) wiring from the panel to the blowers. The heavier gauge wiring has a higher amperage rating than the wiring originally installed.
- Increasing the wire conduit size from panel to blowers to ¾-inch in an attempt to minimize wire overheating.
- Inspection of blowers by vendor technician and local motor shop to ensure shut downs have not permanently damaged blower motors.
- Installation of power meters at the control panel that allow field technicians to monitor blower motor power draw (amperage) during weekly system inspections.
- Opening the system bleed valve or a spare leg on the manifold to draw ambient air into the system, when necessary. This action lowers system vacuum and power draw to below maximum motor rating.

2.5 CONDENSATE DISCHARGE

The condensate collection system removes entrained moisture and debris from the vapor stream. Lower moisture levels improve efficiency of GAC treatment and removal of debris prevents damage to the blowers. The condensate collection system consists of a 140-gallon AWS vessel, transfer pump, 535-gallon free-standing tank, 1,635-gallon trailer mounted transfer tank, and associated piping and valves.

Condensate is pumped from the AWS vessel to the 535-gallon free standing tank located immediately outside of the SVE building (east side). The transfer pump is automatically controlled by a series of floats within the AWS vessel. The pump can also be manually operated via the system computer or pump switch located adjacent to the transfer pump.

Once the free standing tank reaches capacity, water is pumped to a 1,650 gallon trailer-mounted transfer tank for sampling and disposal to the City of Memphis publicly owned treatment works (POTW) via the discharge point for the existing Industrial Wastewater Discharge Agreement Permit #S-NN3-097. Prior to discharge, a grab sample of the condensate is collected and submitted for laboratory analysis. Results are reviewed and submitted to the City of Memphis for approval prior to discharge. City of Memphis discharge requests are included in Appendix A.

Condensate generation during the first year of FSVE operations was approximately 10 to 25 gallons per day (0.1 to 0.4 gpm) and approximately 4,080 gallons was discharged to the POTW. Approximately 2,014 gallons was discharged to the City of Memphis POTW on 21 February 2008. Subsequent discharges were added to the TSVE condensate and treated by the liquid phase GAC vessels prior to discharge.

3.0 SYSTEM MONITORING ACTIVITIES

System monitoring activities consist of PID field measurements and analysis of vapor samples from SVE wells, the treatment system and VMPs. The monitoring activities are performed in accordance with the FSVE RAWP and follow procedures outlined in the FSVE O&M Manual. Sampling activities are performed in accordance with past practice and the *Remedial Action Sampling and Analysis Plan* (RA SAP) (MACTEC, 2005).

3.1 FIELD MEASUREMENTS

VOC concentrations are estimated through field measurements at individual SVE wells, system influent, and less frequently at VMPs using a MiniRae 2000 (10.6 eV lamp) photoionization detector (PID). The PID monitors VOCs in real time and is calibrated with a 100 parts per million (ppm) concentration of isobutylene prior to each use. Field VOC concentrations are recorded on field sheets.

Field VOCs concentrations are collected from individual SVE wells, treatment system (system influent, mid-bed, and effluent), and VMPs. For measurements at the SVE wells and VMPs, a pump is used to draw the vapor stream into a tedlar bag. The PID meter is then connected to the tedlar bag to measure the VOC concentration. No pump is needed to measure VOC concentrations at the system treatment system sample locations as these areas are under positive pressure. PID readings collected at the SVE wells and system are shown on Table 3-1.

PID readings were collected from VMPs prior to system startup and then quarterly throughout Year 1. Additional PID readings were collected periodically throughout the year and from selected VMPs (VMPs 2A/B, VMP-6A/B, VMP-7A/B, and VMP-8A/B) in April 2008 as part of the rebound study. The SVE system is shutdown for two to four hours prior to the VMP measurements. The VMPs are first purged of three tubing volumes using the sampling pump. PID readings are collected until three consecutive readings are within 10%. The final PID readings from VMPs are shown on Table 3-2.

3.2 VAPOR SAMPLING

Vapor samples were collected periodically during Year 1 to monitor system performance and to confirm treatment system compliance with permitted discharge limits.

Laboratory samples were collected into 6-liter Summa canisters with a regulator that limited sample collection at 200 milliliters per minute (ml/min). The Summa canister is shipped from the laboratory

with negative pressure; thus, a sampling pump is not required for sample collection. Samples were submitted to Test America Laboratories in Knoxville, TN for analysis of VOCs by U.S. EPA Method TO-15.

3.2.1 Baseline Events

Baseline samples were collected from SVE wells, treatment system, and VMPs over five events during the first two months of operation. Samples were scheduled to be collected from SVE wells and treatment system at monthly intervals during the first quarter of operations. Additional samples were collected from the treatment system to assess GAC performance.

- Baseline Event #1 (25 July 2007) – Samples collected from all VMPs prior to system startup and from SVE wells and system (influent, mid-bed, and effluent) after the system had operated for approximately four hours.
- Baseline Event #2 (3 August 2007) – Samples collected from the SVE treatment system (influent, mid-bed, and effluent) after being online for four hours. The samples were collected to assess treatment system performance following shut down on 1 August.
- Baseline Event #3 (16 August 2007) – Samples collected from the SVE treatment system (influent, mid-bed, and effluent) to assess treatment system performance following GAC change out on 13 August.
- Baseline Event #4 (23 August 2007) –Samples collected from SVE wells and treatment system (influent, mid-bed, and effluent locations) following one month of operation.
- Baseline Event #5 (19 September 2007) – Samples collected from SVE wells and treatment system (influent, mid-bed, and effluent) following two months of operations.

3.2.2 Quarterly Events

Following the baseline events, samples were collected from the SVE wells and system influent on a quarterly basis in October 2007, January 2008, April 2008, and July 2008. No samples were collected from the mid-bed and effluent location because the GAC emissions system was offline.

3.2.3 VMP Samples

Following the initial baseline event, annual samples were collected from all VMPs on 16 July 2008.

3.2.4 Rebound Study

The January 2008 quarterly samples indicated three SVE wells (SVE-B, SVE-E, and SVE-F) were contributing less than 2% of the VOC mass removed and had CVOC concentrations near RGs. The wells were shut down for a four-week period (20 March to 18 April 2008) to evaluate contaminant rebound. The four other SVE wells remained online with both blowers in operation. Laboratory samples were collected from the three offline wells and associated VMPs (VMP-2A/B, VMP-6A/B, VMP-7A/B, and VMP-8A/B). at two weeks (Rebound Event #1A) and four week (Rebound Event #1B) into the shutdown. SVE-B, SVE-E, and SVE-F were brought back online 18 April 2008. VMPs were purged prior to laboratory sampling with a sampling pump as previously described.

3.3 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Field quality control (QC) samples were collected during each sampling event. Field QC samples consisted of one sample duplicate Summa canister collected for approximately every 10 samples (10%). Laboratory QA/QC samples included surrogate spikes, method blanks, laboratory control samples (laboratory control duplicates). All sampling and analytical methods followed procedures described in the *EPA Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (EPA, 1999).

Documentation was completed in the field to ensure that the Summa canister samples collected, chain-of-custody, and request for analysis were in agreement. Custody seals were placed on each canister shipping container before shipment by common carrier. Samples were typically shipped the day collected for overnight delivery to the laboratory.

4.0 SUMMARY OF ANALYTICAL RESULTS

Vapor samples for laboratory analysis were collected during the following sample events:

Event	Date	Samples
Baseline #1	25 July 2007	SVE wells; System Influent, Mid-bed and Effluent; VMPs
Baseline #2	3 August 2007	System Influent, Mid-bed and Effluent
Baseline #3	16 August 2007	System Influent, Mid-bed and Effluent
Baseline #4	23 August 2007	SVE wells; System Influent, Mid-bed and Effluent
Baseline #5	19 Sept 2007	SVE wells; System Influent, Mid-bed and Effluent
4th Quarter, 2007	18 October 2007	SVE wells; System Influent
1st Quarter, 2008	17 January 2008	SVE wells; System Influent
Rebound #1A	3 April 2008	SVE-B, -E and –F; VMP-2, -6, -7 and -8
Rebound #1B	18 April 2008	SVE-B, -E and –F; VMP-2, -6, -7 and -8
2nd Quarter, 2008	24 April 2008	SVE wells; System Influent
3rd Quarter, 2008	16 July 2008	SVE wells; System Influent; VMPs

Complete analytical results for vapor samples are presented by event in Appendix B. Analytical results summaries are presented by event on Tables 4-1 to 4-10. The summary tables list the results for the primary CVOCs and other analytes detected above the reporting limit in one or more samples, and the total VOC concentration for each sample. The summary tables also list the protective soil vapor concentration (fluvial deposits) for the primary CVOCs.

4.1 DATA QUALITY EVALUATION

e^2M performed data quality evaluation (DQE) of the laboratory data packages for the vapor samples collected during Year 1 operations to qualify the data relative to the data quality objectives (DQOs) described in the RA SAP. Data qualifiers are shown on the analytical results tables. Any result reported below the reporting limit (RL) but above the method detection limit (MDL) was flagged "J" and considered an estimated result (unless overridden by other QC flags). A summary of the DQE for each event is provided in Appendix C.

The vapor sample data collected from July 2007 through July 2008 from SVE wells, treatment system and VMPs meet the DQOs and are deemed sufficient to support decisions regarding the effectiveness of SVE system performance.

4.2 ANALYTICAL RESULTS

4.2.1 Baseline Events

Analytical results for SVE well and system samples collected shortly after start-up in Baseline Event #1 are summarized on Table 4-1. Total VOCs in the SVE wells ranged from 1,008 parts per billion by volume (ppbv) (SVE-B) to 1,885,600 ppbv (SVE-C) and total VOCs in the system sample were 1,263,860 ppbv for influent, 17.1 ppbv for mid-bed and 6.15 ppbv for effluent. The primary CVOCs at the highest concentration in the SVE wells were TCE and 1,2-DCE in SVE-C and TeCA in SVE-D. The primary CVOCs in the system effluent were TCE (53%), TeCA (23%), and 1,2-DCE (17%).

Analytical results for VMP samples collected shortly before start-up in Baseline Event #1 are summarized on Table 4-2. Total VOCs in the shallow 'B' VMPs ranged from 48,260 ppbv (VMP-01B) to 3,304,500 ppbv (VMP-03B) and in the deep 'A' VMPs from 2,150 ppbv (VMP-10A) to 2,691,000 ppbv (VMP-05A). The primary CVOC at the highest concentration was TCE in VMP-03B (2,700,000 ppbv).

Analytical results for SVE system samples collected after system shutdown in Baseline Event #2 and after the system was re-started in Baseline Event # 3 are summarized on Table 4-3. Total VOCs during Baseline Event #2 were 120,800 ppbv in the system influent, 229,490 ppbv in the mid-bed and 208,620 ppbv in the effluent. The higher VOC concentration in the effluent as compared to the influent confirmed that the GAC was at its adsorption capacity in both vessels. Total VOCs during Baseline Event #3 were 100,650 ppbv in the system influent, 96.7 ppbv in the mid-bed 31.5 ppbv in the effluent. The primary CVOCs in the system influent for Baseline Events #2 and #3 were TCE (58% and 51%, respectively), 1,2-DCE (17% and 12%, respectively), and TeCA (12% and 25% respectively).

Analytical results for SVE well and system samples collected after one month of operation in Baseline Event #4 are summarized on Table 4-4. Total VOCs in the SVE wells ranged from 41.4 ppbv (SVE-F) to 149,796 ppbv (SVE-G) and total VOCs in the system sample were 31,821 ppbv for influent, 64,360 ppbv for mid-bed and 43.1 ppbv for effluent. The primary CVOCs at the highest concentration in the SVE wells were chloroform in SVE-G, TCE in SVE-C and SVE-D, TeCA in SVE-D. The primary CVOCs in the system influent were TCE (44%), TeCA (27%), and chloroform (13%).

Analytical results for SVE well and system samples collected after two months of operation in Baseline Event #5 are summarized on Table 4-5. Total VOCs in the SVE wells ranged from 29 ppbv (SVE-B) to 38,073 (SVE-G) and total VOCs in the system sample were 14,993 ppbv for influent 21,997 ppbv for mid-bed and 19,490 ppbv for effluent. The primary CVOCs at the highest concentration in the SVE wells

were chloroform in SVE-G, TCE in SVE-C, and TeCA in SVE-G. The primary CVOCs in the system influent were TCE (57%), 1,2-DCE (16%), and TeCA (15%).

4.2.2 Quarterly Events

Analytical results for SVE well and system samples collected after one quarter of operation in 4Q07 are summarized on Table 4-6. Total VOCs in the SVE wells ranged from 17.6 ppbv (SVE-E and SVE-F) to 23,060 ppbv (SVE-C) and total VOCs in the system influent sample was 16,119 ppbv. No mid-bed and effluent samples were collected as the GAC vessels were offline. The primary CVOCs at the highest concentration in the SVE wells were TCE in SVE-C, 1,2-DCE and chloroform in SVE-G, and TeCA in SVE-D. The primary CVOCs in the system influent were TCE (50%), TeCA (19%), and chloroform (12%).

Analytical results for SVE well and system samples collected after two quarters of operation in 1Q08 are summarized on Table 4-7. Total VOCs in the SVE wells ranged from 104 ppbv (SVE-B) to 41,380 ppbv (SVE-G) and total VOCs in the system influent sample was 20,019 ppbv. The primary CVOCs at the highest concentration in the SVE wells were chloroform in SVE-G, TCE in SVE-C, TeCA in SVE-D. The primary CVOCs in the system influent were TCE (55%), 1,2-DCE (17%), and chloroform (15%).

Analytical results for SVE well and system samples collected after three quarters of operation in 2Q08 are summarized on Table 4-8. Total VOCs in the SVE wells ranged from 5.58 ppbv (SVE-F) to 16,626 ppbv (SVE-C) and total VOCs in the system influent sample was 15,280 ppbv. No mid-bed and effluent samples were collected as the GAC vessels were offline. The primary CVOCs at the highest concentration in the SVE wells were TCE in SVE-C, chloroform in SVE-A, and TeCA in SVE-D. The primary CVOCs in the system influent were TCE (48%), 1,2-DCE (20%), and chloroform (14%).

Analytical results for SVE well and system samples collected after one year of operation in 3Q08 are summarized on Table 4-9. Total VOCs in the SVE wells ranged from 32.6 ppbv (SVE-A) to 43,760 ppbv (SVE-D) and total VOCs in the system influent sample were 11,795 ppbv. No mid-bed and effluent samples were collected as the GAC vessels were offline The primary CVOCs at the highest concentration in the SVE wells were TCE in SVE-D, TeCA and 1,2-DCE in SVE-C. The primary CVOCs in the system effluent were TCE (58%), TeCA (23%), and 1,2-DCE (12%).

Analytical results for VMP samples collected after one year of operation in 3Q08 are summarized on Table 4-10. Total VOCs in the shallow ‘B’ VMPs ranged from 191 ppbv (VMP-01B) to 8,359,400 ppbv

(VMP-06B) in the deep 'A' VMPs from 28.7 ppbv (VMP-01A) to 4,627 ppbv (VMP-09B). The primary CVOC at the highest concentration was TCE at 5,800,000 ppbv (VMP-03B).

4.2.3 Rebound Event #1

Analytical results for SVE well samples collected two weeks after shut-down in Rebound #1A and four weeks after shutdown in Rebound #1B are summarized on Table 4-11. Total VOCs in the SVE wells ranged from 14.0 ppbv to 26.0 ppbv after two weeks and from 12.9 ppbv to 16.1 ppbv after four weeks. The concentrations were lower than in samples during 1Q08 (the previous sampling event) and were relatively stable in the two events.

Analytical results for VMP samples collected two weeks and four weeks after shut down are summarized on Table 4-12. After two weeks, total VOCs in the shallow 'B' VMPs ranged from 1,001 ppbv to 571,200 ppbv and in the deep 'A' VMPs from 170 ppbv to 743 ppbv. After four weeks, total VOCs in the shallow 'B' VMPs ranged from 2,208 ppbv to 315,560 ppbv and in the deep 'A' VMPs from 390 ppbv to 503 ppbv. VMP sample results show increases between the two rebound events in all VMPs except VMP-6A and VMP6B. VMP-6A/B is located 45 feet from both SVE-D and SVE-E, and SVE-D remained in operation during the rebound study. Higher VOC concentrations at VMP-2B and -6B indicated significant mass remains in these areas, even through the associated SVE wells have low VOC concentrations.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SYSTEM OPERATIONS

System uptime during Year 1 (27 July 2007 through 1 August 2008) was 92.8%. During system operations, two blowers were in use 88.5% of the time.

The primary causes of downtime in Year 1 were high initial VOC extraction rates that exceeded the adsorption capacity of the GAC and electrical problems with the blowers. Vapor influent concentrations decreased quickly after system start-up and GAC treatment of the effluent was halted in October 2007. The GAC vessels were filled with re-activated GAC in December 2007 and are available for use if needed. The electrical problems are due to the blowers operating near the peak of their performance curve because of high vacuum demand. Both blowers were replaced under manufacturer's warranty to maintain operations and procedures were adjusted more closely monitor blower wiring and amperage.

SVE wells were generally operated in the 100% open position. Average operating conditions with both blowers in operation were:

Location	Flow Rate (acfm)	Vacuum (inches H_2O)
SVE-A	75	90
SVE-B	185	70
SVE-C	190	62
SVE-D	160	64
SVE-E	175	64
SVE-F	160	69
SVE-G	30	89
Influent	775 (scfm)	5.2 (inches Hg.)

System readings (flow rates, vacuums, temperatures, etc.) are collected weekly and have been fairly consistent throughout Year 1. Higher flow rates are being extracted from SVE-B, -C, -D, -E, and -F; wells SVE-A and SVE-G are screened in tighter soils. Vacuum measurements at VMPs indicate a vacuum influences at distances greater than 80 feet at all SVE wells.

5.2 FIELD MEASUREMENTS AND LABORATORY RESULTS

5.2.1 SVE Wells and System

The trend in PID measurements at SVE wells is shown on Figure 5-1. PID readings gradually declined from system startup until June 2008 when thermal SVE operations began to increase VOC migration from the overlying loess. An increase was also seen at SVE-B in April 2008 due to the rebound test.

Total VOC concentrations at SVE wells at system startup were above 50,000 ppbv at all but two locations; concentrations at SVE-B and SVE-E were at 1,503 ppbv and 1,003 ppbv, respectively. Laboratory results collected after three months of operation generally declined by a factor of 100 or more in all wells compared to samples collected at startup. CVOC concentrations continued to decline until thermal SVE operations began to impact vapor concentrations. The primary CVOC concentrations in each SVE well and system influent in the Year 1 laboratory samples are listed on Table 5-1. The primary CVOCs at highest concentration were TCE in SVE-A, -B, -D, -E, and -F; TeCA in SVE-C; and chloroform in SVE-G.

Laboratory samples collected at the system influent show an asymptotic trend since start up and are similar to the trend in PID readings. System influent concentration trends are plotted on Figure 5-2 and show a close relationship between field measurements and laboratory results. The trend in total VOC concentrations at SVE wells and system influent is shown on Figure 5-3.

5.2.2 Vapor Monitoring Points

The trend in PID measurements at -A VMPs is shown on Figure 5-4 and at -B VMPs on Figure 5-5. The trend plots indicate TSVE operations resulted in higher CVOC concentrations at several VMPs. The increases were generally limited to the shallower -B VMPs while concentrations generally decreased in the deeper -A VMPs.

Baseline VMP samples had concentrations up to 2,700,000 ppbv (TCE at VMP-3B), as shown on Table 4-2. TeCA, chloroform, PCE, and 1,2-DCE were also detected at high concentrations. 3Q08 samples, collected one year after startup, had concentrations up to 300,000 ppbv (TeCA at VMP-06B) (Table 4-12). Increases were seen in several samples collected during 3Q08 due to TSVE operations; the largest increases over Baseline Event #1 results were reported in VMP-2B, -3B, -5B, and -6B. CVOC concentrations in other VMPs decreased over 90% from Baseline Event #1 samples.

5.3 FLUVIAL SVE MASS ESTIMATES

VOC concentrations in the influent sample (based on TCE, the primary constituent), system operating hours, and flow rates were used to calculate the VOC mass removed from the fluvial soils. VOC concentrations used for mass calculations are shown in Table 5-2. Mass emission calculations are shown on Table 5-3. Approximately 2,788 pounds of VOCs were removed during Year One operations.

Influent emission rates were estimated as high as 17 pounds per hour (lb/hr) at system startup, but have declined as concentrations have decreased. Based on results from the 3Q08 event, influent emission rates are estimated at 0.17 lb/hr.

The Memphis/Shelby County Health Department Operations Permit for the SVE system has a maximum VOC emission limit of 5.71 lb/hr. The emission rate discharged to the atmosphere did not exceed 2.35 lb/hr during Year One.

5.4 RECOMMENDATIONS

No changes are recommended to FSVE operations. The Year Two analytical results will show less impact from thermal SVE operations and provide a better basis for reviewing operations.

6.0 REFERENCES

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TABLES

TABLE 2-1
SYSTEM FLOW RATE AND VACUUM READINGS[1]
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Date/Time of Recording	Number of Blowers in Operation	SVE-A		SVE-B		SVE-C		SVE-D		SVE-E		SVE-F		SVE-G		System	
		Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (scfm)	Vacuum (in. Hg.)[2]
7/25/2007 16:00	2	Readings not recorded.															
7/27/2007 07:45	2	80	5.0	150	3.0	160	2.5	145	3.0	145	3.0	145	3.0	50	5.0	785	4.86
7/28/2007 11:30	2	60	5.0	140	3.0	145	2.0	150	3.5	145	3.6	140	3.0	40	5.0	746	4.87
7/29/2007 07:40	2	60	5.5	140	3.0	145	2.0	150	3.5	150	4.0	140	3.0	30	5.0	741	5.03
7/30/2007 12:42	2	60	6.0	145	3.5	145	2.0	150	3.5	150	4.0	140	3.0	30	5.0	740	4.88
7/31/2007 10:59	2	60	5.4	145	3.5	148	2.1	150	3.5	150	3.9	140	3.0	40	5.0	738	4.93
8/1/2007 13:48	2	60	6.0	145	3.5	145	2.3	145	3.5	150	3.9	145	3.0	40	5.0	740	4.87
8/3/2007 12:00	Readings not recorded. [3]																
8/15/2007 13:00	1	20	3.0	100	2.0	115	<1 [4]	110	2.0	110	<1 [4]	110	<1 [4]	20	2.0	602	2.36
8/16/2007 12:30	1	40	3.0	100	2.0	100	<1 [4]	100	2.0	100	2.0	100	2.0	<20	1.5	597	2.74
8/17/2007 12:00	1	20	3.0	100	2.0	100	<1 [4]	100	2.0	100	1.5	100	1.5	<20	2.5	608	2.77
8/20/2007 07:34	1	20	3.2	100	2.0	100	<1 [4]	100	2.0	100	2.0	100	2.0	<20	3.0	609	2.87
8/21/2007 07:30	1	40	3.5	90	2.0	100	<1 [4]	100	2.0	90	<1 [4]	90	<1 [4]	<20	3.0	593	3.13
8/22/2007 07:45	1	50	4.0	100	2.0	100	<1 [4]	100	2.0	100	<1 [4]	100	<1 [4]	20	3.5	571	3.51
8/23/2007 08:30	1	50	4.0	90	2.0	90	<1 [4]	90	2.0	90	<1 [4]	90	<1 [4]	20	3.5	560	3.49
8/27/2007 06:58	1	50	4.0	95	2.0	90	1.0	85	2.0	90	2.0	90	1.0	20	3.5	563	3.59
8/28/2007 09:00	1	30	4.0	90	2.0	90	1.0	95	1.5	95	2.0	90	1.0	20	3.5	550	3.55
8/29/2007 06:55	1	40	4.0	95	1.0	90	<1 [4]	90	2.0	85	2.0	90	1.0	20	3.5	562	3.60
8/31/2007 08:00	2	50	4.5	130	3.5	170	3.0	145	3.5	130	3.5	130	3.5	20	4.0	870	3.93
9/4/2007 08:30	2	50	4.5	130	3.0	170	3.0	150	3.0	150	3.5	140	3.0	20	4.0	870	3.89
9/5/2007 09:20	2	50	5.0	150	4.0	190	3.0	170	4.0	150	4.0	160	3.5	50	4.5	802	4.64
9/7/2007 13:55	2	50	5.0	150	3.0	170	3.5	170	4.0	150	4.0	160	3.5	<20	4.5	800	4.82
9/14/2007 08:10	2	60	5.0	145	4.0	190	3.0	160	4.0	160	3.5	150	3.5	30	4.5	810	4.69
9/17/2007 07:59	2	60	5.0	145	4.0	190	3.0	160	4.0	170	3.0	150	3.5	20	4.5	800	4.71
9/19/2007 14:02	1	20	3.0	110	2.5	150	2.0	20	0.0	120	2.0	110	2.5	<20	3.0	579	2.74
9/21/2007 12:32	2	50	5.0	140	3.8	190	3.0	160	3.9	165	3.2	150	3.6	20	4.5	800	4.49
9/28/2007 08:20	2	50	5.0	145	3.6	200	3.2	160	4.0	170	3.3	150	3.6	20	4.4	806	4.75
10/5/2007 08:45	2	50	5.0	140	3.7	195	3.0	160	4.0	170	3.3	150	3.6	20	4.5	796	4.63
10/11/2007 11:55	2	50	5.0	150	4.0	195	3.5	160	4.0	165	3.5	155	4.0	<20	5.0	831	4.95
10/18/2007 07:50	2	50	5.0	150	4.0	200	3.5	160	4.0	180	3.5	150	4.0	<20	5.0	796	4.82
10/25/2007 12:05	2	60	5.0	150	4.0	200	3.5	170	4.0	180	3.0	160	4.0	20	5.0	805	5.02
11/1/2007 15:20	1	20	2.5	100	2.0	150	1.5	100	2.5	120	2.0	110	2.0	<20	2.0	615	2.38
11/9/2007 12:10	1	30	2.0	110	1.5	150	1.0	100	0.5	110	2.5	110	1.0	<20	1.5	605	2.48
11/15/2007 07:40	1	50	3.0	120	2.5	140	2.5	110	2.5	120	3.0	100	2.5	<20	3.0	600	2.80
11/21/2007 08:40	2	50	5.0	160	5.0	190	4.0	170	3.5	180	4.5	160	4.0	20	5.5	798	5.21
11/29/2007 09:00[5]	2	70	84	160	72	180	4.0	170	62	180	64	150	70	50	86	803	5.38
12/6/2007 07:40	2	70	90	160	80	180	4.0	170	64	180	66	160	70	20	88	794	5.42
12/21/2007 07:50	2	60	88	170	76	180	62	160	64	170	65	150	70	20	88	775	5.36
12/28/2007 14:00	2	60	88	170	78	190	62	160	66	190	66	150	70	30	88	793	5.50
1/4/2008 09:00	2	60	90	180	78	190	62	180	66	180	68	160	70	30	90	799	5.53
1/11/2008 07:00	2	60	88	170	76	180	62	160	64	180	66	150	70	50	88	794	5.37
1/17/2008 09:00	2	70	90	170	78	790	62	170	65	190	66	150	72	20	92	779	5.53
1/24/2008 07:30	2	70	92	180	80	190	64	170	68	190	68	150	74	40	94	800	5.62
2/1/2008 08:45	2	100	95	180	82	190	75	170	70	190	64	160	77	70	91	771	5.50
2/8/2008 08:00	2	90	91	180	79	190	64	170	66	190	66	160	72	70	92	783	5.48
2/15/2008 09:00	1	70	64	130	60	150	50	130	52	130	52	110	58	20	64	542	3.70
2/22/2008 07:15	1	50	66	140	60	150	46	130	52	130	61	110	56	50	64	554	3.48
2/29/2008 08:15	2	70	92	170	80	190	64	160	68	180	66	150	74	40	92	793	5.45

TABLE 2-1
SYSTEM FLOW RATE AND VACUUM READINGS[1]
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Date/Time of Recording	Number of Blowers in Operation	SVE-A		SVE-B		SVE-C		SVE-D		SVE-E		SVE-F		SVE-G		System	
		Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (acfm)	Vacuum (in. Hg.)[2]	Flow rate (scfm)	Vacuum (in. Hg.)[2]
3/6/2008 07:15	2	90	90	180	79	190	64	180	66	190	66	160	74	50	92	773	5.49
3/14/2008 09:00	2	80	98	190	82	200	68	185	70	0[6]	0[6]	180	78	50	98	700	5.96
3/20/08 16:15[7]	2	120	98	0	0	200	70	190	72	0	0	0	0	50	100	700	6.14
3/27/2008 7:15[7]	2	110	98	0	0	200	66	180	68	0	0	0	0	50	100	730	5.96
4/3/2008 7:00[7]	2	90	100	0	0	200	70	190	70	0	0	0	0	30	100	700	6.09
4/10/2008 15:00[7]	2	80	94	0	0	190	65	175	66	0	0	0	0	50	96	644	6.37
4/17/2008 16:15	2	90	82	150	64	190	58	170	56	190	56	170	60	40	82	821	4.84
4/18/2008 07:15	2	80	88	200	68	190	62	160	62	190	62	160	66	20	90	784	5.16
4/24/2008 11:30	2	70	86	185	67	180	62	160	64	180	62	170	64	20	89	800	5.08
5/2/2008 07:45	2	80	86	185	68	180	62	170	62	175	62	160	64	50	88	780	5.01
5/8/2008 07:45	2	60	84	180	66	180	62	160	62	170	61	160	64	20	88	775	5.00
5/15/2008 12:30	2	70	82	190	66	180	62	170	62	170	62	170	64	50	86	775	5.00
5/22/2008 08:45	2	100	82	190	66	190	62	170	62	180	62	170	64	70	86	778	5.03
5/30/2008 08:45	2	70	82	170	66	N/R[8]	62	165	62	175	60	160	65	20	87	765	4.92
6/5/2008 07:30	2	70	86	190	68	190	62	140	62	170	62	160	66	30	86	755	4.95
6/13/2008 09:26	2	70	85	180	68	200	64	150	64	180	64	150	68	40	88	745	5.01
6/19/2008 08:33	2	60	88	180	70	190	58	150	64	170	64	150	70	20	90	761	5.22
6/26/2008 08:09	2	90	88	190	70	200	60	160	64	180	66	160	72	40	90	744	5.20
7/3/2008 07:30	2	70	90	180	72	190	62	150	66	170	66	150	72	20	92	740	5.28
7/11/2008 07:20	2	80	90	180	74	200	60	150	66	180	66	160	74	50	92	724	5.32
7/16/2008 07:05	2	60	92	180	74	200	62	150	74	180	68	150	76	20	94	731	5.36
7/18/2008 09:10	2	90	92	190	74	200	62	160	66	180	66	140	76	20	92	734	5.30
7/24/2008 13:52	2	60	92	180	76	190	62	150	66	170	66	140	76	20	94	719	5.27
8/1/2008 12:16	2	60	92	180	76	140	60	150	68	170	68	150	76	20	94	705	5.30

(1) - Vacuum measured at blower manifold.
(2) - For all wells, except SVE-C, units are in in. H_2O from 11/29/08 to present. For SVE-C, units are in in. H_2O from 12/21/08 to present.
(3) - To minimize system operation time, the SVE system was online for laboratory sampling only from 11:00 AM to 12:00 PM.
(4) - Readings below 1 in. Hg. are too low to be registered on vacuum gauges which have a span of 0 - 30 in. Hg.
(5) - Vacuum gauges with a smaller span installed on all wells but SVE-C (shipped inoperable) on 28 November 2007. New gauge are in units of inches of water (in. H_2O) and have spans of 0 to -100 in. H_2O (0 to 7.353 in. Hg.) Replacement gauge for SVE-C installed on 21 December 2007.
(6) - SVE-E damaged during other onsite remedial action activities and was offline during 3/14/08 inspection. No reading collected.
(7) - Rebound Event #1 occurred from 3/20/08 to 04/17/08. SVE-B, SVE-E, and SVE-F were offline during this period.
(8) - Gauge could not be read due to debris/grime in site glass.
SVE-D valve left in closed position following system tests on 9/19/07.
acfm: actual cubic feet per minute
N/R: not recorded
scfm: standard cubic feet per minute
in. Hg. = inches of mercury
in. H_2O - inches of water
0.07353 x in. H_2O = in. Hg.

TABLE 2-2
SYSTEM VACUUM READINGS AT VMPs
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

VMP ID[2]	Closest SVE Well	Distance from Closest SVE Well (ft)	Vacuum Reading Recorded (in. H_2O) [1]																	
			8/20/07	8/20/07	8/31/07	9/7/07	9/14/07	9/17/07	11/29/07	12/6/07	1/11/08	1/24/08	2/22/08	3/6/08	3/22/08	4/01/08[3]	4/17/08[3]	5/13/08	6/26/08	7/16/08
VMP-1A	SVE-A	15.06	-5	-6	-8	-7	-8	-7	-9.6	-11.0	-11.0	-11.6	-6.0	-11.4	-13.4	-9.2	-6.8	-11.4	-12.2	-12.0
VMP-1B	SVE-A	21.04	-5	-6	-8	-7	-7	-7	-9.6	-11.0	-11.2	-11.8	-6.0	-11.6	-13.6	-9.8	-6.9	-11.8	-12.2	-12.2
VMP-2A	SVE-B	30.68	-6	-6	-8	-7	-8	-7	-10.0	-11.4	-11.5	-12.0	-7.0	-12.0	-14.2	-7.6	-5.2	-11.8	-13.0	-13.0
VMP-2B	SVE-B	37.47	0 [4]	0 [4]	-2	-5	-3	-2	-7.6	-11.4	-12.4	-12.2	-7.0	-12.2	-15.0	-7.8	<-15.0 [5]	-13.6	-13.4	-13.2
VMP-3A	SVE-C	30.68	-4	-4	-6	-5.75	-6	-5	-9.0	-10.0	-10.4	-10.8	-6.8	-10.8	-12.6	-10.0	-8.2	-10.0	-10.2	-10.4
VMP-3B	SVE-C	25.52	-4	-5	-7	-7	-7	-6	-10.8	-12.0	-12.3	-12.8	-8.0	-12.6	-14.6	-12.0	-9.6	-11.2	-11.2	-11.8
VMP-4A	SVE-C	59.99	0 [4]	0 [4]	0 [4]	1 [4]	-5	-5	-8.2	-9.0	-9.8	-10.0	-6.4	-10.0	-12.0	-9.0	-7.4	-8.8	-9.0	-9.2
VMP-4B	SVE-C	59.53	-4	-4	-6	-5	-6	-5	-7.8	-9.0	-9.4	-9.8	-6.0	-9.8	-11.6	-8.8	-7.2	-8.4	-8.8	-9.0
VMP-5A	SVE-D	30.99	-5	-5	-7	-7	-8	-7	-11.2	-12.4	-12.8	-13.2	-8.8	-13.0	-14.8	-9.8	-7.9	-11.4	-11.6	-12.0
VMP-5B	SVE-D	31.05	-5	-5	-7	-8	-8	-8	-11.4	-12.6	-13.0	-13.3	-8.8	-13.0	-14.8	-9.4	-7.8	-11.6	-11.8	-12.2
VMP-6A[6]	SVE-E	45.01	-5	-5	-8	-7	-8	-8	-11.6	-13.0	-13.2	-11.0	-9.0	-13.2	-15.0	-8.8	-7.2	-12.0	-12.2	-12.7
VMP-6B[6]	SVE-E	45.04	-5	-6	-8	-7	-8	-8	-11.5	-12.8	-13.0	-14.6	-9.0	-13.2	-15.0	-8.7	-7.2	-12.0	-12.0	-12.6
VMP-7A	SVE-F	15.30	0 [4]	0 [4]	0 [4]	-1 [4]	-10	-9	-13.6	-15.0	-14.4	<-15.0 [5]	-8.4	-14.8	-17.2	-5.6	-4.2	-14.0	-9.6	-13.4
VMP-7B	SVE-F	15.23	-9	-8	-10	-10	-10	-10	-14.2	<-15.0 [5]	<-15.0 [5]	<-15.0 [5]	-8.6	-15.0	-17.6	-5.8	-4.2	-14.4	-8.4	-13.6
VMP-8A	SVE-F	80.41	-5	-5	-6	0 [4]	-6	-6	-9.6	-11.2	-10.8	-11.4	-6.0	-11.2	-14.2	-5.6	-4.2	-9.8	-13.4	-10.0
VMP-8B	SVE-F	80.17	-4	-2	-4	-4.5	-4	-2	-3.0	-9.0	-9.2	-10.2	-5.0	-9.4	-12.4	-5.4	-4.0	-8.8	-13.6	-8.8
VMP-9A	SVE-G	45.19	-4	-3	-4	-4	-4	-4	-6.2	-7.6	-6.7	-7.3	-2.8	-7.2	-10.2	-5.6	-4.0	-6.0	-6.4	-7.2
VMP-9B	SVE-G	45.18	-4	-3	-4	-4	-4	-4	-6.2	-7.6	-6.6	-7.2	-3.4	-7.0	-10.2	-5.4	-4.4	-6.2	-7.0	-7.6
VMP-10A	SVE-G	60.08	-3	-3	-4	N/R	-4	-4	-6.0	-7.2	-6.3	-7.0	-2.6	-7.0	-10.2	-5.4	-4.2	-6.0	-6.2	-7.0
VMP-10B	SVE-G	60.50	-3	-2	-4	N/R	-4	-4	-5.6	-7.0	-6.2	-7.0	-2.4	-7.0	-10.2	-5.4	-4.2	-6.0	-6.4	-7.0
Number of Blowers Online			**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**

N/R = not recorded

(1) - 0.07353 x in. H_2O = in. Hg.

(2) - All VMP wells contain 5-foot screen lengths. VMP "A" wells (e.g., VMP-1A) were constructed with a screen located near the bottom of the screen of the associated SVE well. VMP "B" wells (e.g., VMP-1B) were constructed with a screen located near the top of the screen of the associated SVE well.

(3) - Rebound Event #1 occurred from 3/20/08 to 04/17/08. SVE-B, SVE-E, and SVE-F were offline during this period.

(4) - Vacuum readings affected by debris lodged in tubing. Debris was removed and tube length shortened by 6 inches on 9/14/07.

(5) - Vacuum reading exceeded gauge span of -15 in Hg.

(6) - VMP-6A and VMP-6B are located equidistant from SVE -D and SVE-E.

Note: Vacuum gauges with a smaller span used on readings after 11/29/07.

in Hg. = inches of mercury

in. H_20 = inches of water

Shaded Cells indicate SVE well offline.

TABLE 3-1
PID MEASUREMENTS AT SVE WELLS AND SYSTEM
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Sample Location									
	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF	SVE-MID	SVE-EFF
Date	PID Measurement (ppm)[1]									
7/26/2007	3863	>10000 [2]	>10000 [2]	2188	>10000 [2]	2196	>10000 [2]	>10000 [2]	510	5.7
7/27/2007	105	1230	927	1861	1193	11.4	108	1091	3.6	0
7/28/2007	59.1	575	417	835	741	38.1	262	538	598	0.2
7/29/2007	53	432	445	667	550	31.1	205	486	554	0.1
7/30/2007	27.3	229	290	399	356	27.6	168	279	570	2.7
7/31/2007	22.7	186	246	338	285	24.6	131	242	528	72.4
8/1/2007	19.1	157	224	288	256	24.4	127	187	560	299
8/15/2007	7.5	153	210	271	234	22.6	131	152	18.1	9.4
8/16/2007	10.3	74.8	164	231	134	19.7	108	116	0	0
8/17/2007	10.2	94.4	140	208	118	16.9	92.4	120	4.7	2.1
8/20/2007	7.4	58.8	111	128	96.0	12.9	67.6	89.5	34.7	0.7
8/21/2007	8.5	38.5	73.8	95	112	12.7	65.1	68.0	37.9	0.6
8/22/2007	7.8	51.2	94.3	105	114	13.5	65.0	78.0	42.6	0.4
8/23/2007	5.6	37.0	84.0	86.8	99.1	12.9	63.8	74.3	74.1	0.1
8/27/2007	4.5	26.2	60.2	92.5	55.9	8.5	33.4	61.1	46.1	1.4
8/28/2007	4.4	28.3	59.8	87.4	61.3	7.4	27.5	59.1	56.1	0.6
8/29/2007	3.9	26.4	57.9	42.3	38.2	6.9	26.1	53.7	53.8	1.4
8/31/2007	5.0	29.7	55.5	67.0	43.3	0.6	32.0	60.9	62.9	11.1
9/4/2007	4.1	28.1	27.9	68.0	18.9	5.8	24.9	44.8	45.2	19.3
9/5/2007	3.8	24.7	50.3	67.7	38.8	7.9	27.6	39.9	46.6	15.1
9/7/2007	2.4	9.6	16.4	29.1	16.3	3.8	12.7	34.5	45.9	15.3
9/14/2007	3.0	16.6	23.1	44.5	25.6	6.1	18.7	24.4	31.3	16.3
9/19/2007	2.4	20.4	27.1	8.2	28.8	2.9	14.5	21.3	30.7	27.4
9/28/2007	2.3	19.0	13.1	35.1	18.6	3.5	16.4	12.1	23.3	32.2
10/5/2007	2.2	21.2	30.9	32.4	17.0	3.7	13.8	20.8	27.5	29.5
10/11/2007	2.7	23.0	9.9	18.7	13.2	0.5	12.8	22.6	N/C[3]	N/C[3]
10/18/2007	1.3	14.0	20.3	14.8	10.3	1.8	3.5	14.3	N/C	N/C
10/25/2007	1.7	15.2	21.2	19.1	10.7	1.5	12.4	17.4	N/C	N/C
11/1/2007	2.0	14.5	24.0	21.2	1.7	4.2	15.6	17.4	N/C	N/C
11/9/2007	1.2	21.9	22.3	21.3	8.2	1.5	10.7	16	N/C	N/C
11/15/2007	1.8	23.8	21.5	21.1	12.7	1.7	10.0	9.3	N/C	N/C
11/21/2007	2.6	27.6	23.4	22	9.6	2.7	10.2	17.9	N/C	N/C
11/29/2007	2.2	31.1	34.1	18.7	10.9	1.7	16.2	25.7	N/C	N/C
12/6/2007	1.7	24.9	18.5	8.4	6.1	3.5	6.8	20.2	N/C	N/C
12/21/2007	5.4	46.1	31.4	14.5	6.4	0.7	12.3	28.1	N/C	N/C
12/28/2007	1.2	65.9	33.8	9.8	4.3	1.1	15.4	23.4	N/C	N/C
1/4/2008	0.9	41.6	19.1	1.5	3.2	0.3	20	22.5	N/C	N/C
1/11/2008	1.2	61.0	37.5	24.4	5.3	2.3	9.8	20	N/C	N/C
1/17/2008	7.6	27.6	3.7	6.7	1.9	8.0	7.5	18.8	N/C	N/C
1/24/2008	1.8	67.8	10.9	2.2	2.8	0.4	7.6	26.1	N/C	N/C
2/1/2008	0.8	48.9	13.3	4.6	2.1	1.0	8.1	20.9	N/C	N/C
2/8/2008	0.8	31.8	18.4	5.8	1.7	2.4	17.5	6.6	N/C	N/C
2/15/2008	0.9	17.7	5.3	3.9	1.4	0.6	12.4	15.5	N/C	N/C
2/22/2008	0.7	48.6	8.3	4.8	2.3	1.0	13.0	15.8	N/C	N/C
2/29/2008	27.3	39.2	21.5	14.4	5.6	3.1	5.4	17.9	N/C	N/C
3/6/2008	0.3	28.5	13.8	4.2	7.3	0.3	13.2	12.1	N/C	N/C
3/14/2008	13.8	37.3	22.4	16.8	N/C[4]	17.1	17.5	25.8	N/C	N/C
3/20/2008[5]	0.7	N/C	26.1	0.7	N/C	N/C	0.4	10.4	N/C	N/C
3/27/2008[5]	0.0	N/C	21.6	4.0	N/C	N/C	0.0	6.2	N/C	N/C
4/3/2008[5]	9.3	N/C	15.4	5.2	N/C	N/C	8.1	10.6	N/C	N/C
4/10/2008[5]	3.1	N/C	5.7	0.9	N/C	N/C	8.2	6.2	N/C	N/C
4/18/2008	5.1	103	12.7	4.0	0.4	0.5	5.2	34.5	N/C	N/C
4/24/2008	0.4	31.7	7.2	4.8	2.5	0.6	8.7	13.5	N/C	N/C
5/2/2008	0.3	22.0	18.6	2.7	1.6	0.3	8.9	10.3	N/C	N/C
5/8/2008	0.7	27.2	9.5	3.8	1.6	0.6	11.1	9.8	N/C	N/C
5/13/2008	0.6	24.4	14	3.8	7.3	0.6	20.3	16.4	N/C	N/C
5/15/2008	0.5	17.8	5.1	2.4	1.9	0.7	5.4	8.6	N/C	N/C

TABLE 3-1
PID MEASUREMENTS AT SVE WELLS AND SYSTEM
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Sample Location									
	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF	SVE-MID	SVE-EFF
Date	PID Measurement (ppm)[1]									
5/22/2008	0.4	7.7	7.3	3.9	1.6	0.5	7.3	8.1	N/C	N/C
5/30/2008	0.3	7.0	7.1	1.5	1.1	0.3	1.2	3.7	N/C	N/C
6/5/2008	1.4	4.7	3.8	2.6	1.4	1.3	1.7	2.9	N/C	N/C
6/13/2008	0.6	5.6	5.6	6.5	2.3	0.7	1.3	3.6	N/C	N/C
6/19/2008	0.5	6.9	0.4	11	0.9	0.4	1.2	5.6	N/C	N/C
6/26/2008[6]	0.0	0.0	0.0	14.1	1.8	0.6	0.9	4.2	N/C	N/C
6/30/2008	0.6	9.2	14.4	22.8	5.4	0.9	1.9	11.4	N/C	N/C
7/3/2008	0.3	8.7	10.7	6.8	1.1	0.3	1.0	10.0	N/C	N/C
7/11/2008	0.3	13.9	16.5	39.9	0.9	0.7	1.8	13.7	N/C	N/C
7/16/2008	0.4	22.7	15.6	54.5	0.9	1.6	2.6	17.6	N/C	N/C
7/18/2008	0.8	25.9	22.3	76.8	2.1	2.9	4.9	23.8	N/C	N/C
7/24/2008	1.5	29.1	15.8	70.3	5.0	1.8	7.5	22.8	N/C	N/C
8/1/2008	0.6	40.4	10.0	48.4	2.5	1.4	8.8	21.8	N/C	N/C

(1) = Photo Ionization Detector (PID) manufactured by RAE System (Model: MiniRAE 2000) with a 10.6 eV lamp.
(2) = Influent stream exceeded maximum range of PID meter (10,000 ppm).
(3) = PID reading not collected as treatment system was taken offline following 5 October 2007 readings.
(4) = SVE-E damaged during other onsite remedial action activities and was offline during 3/14/08 inspection. No reading collected.
(5) = Rebound Event #1 occurred from 3/20/08 to 04/17/08. SVE-B, SVE-E, and SVE-F were offline during this period.
(6) = PID readings believed to be in error due to malfunctioning PID. Readings recollected on 6/30/08.
ppm: parts per million
PID: photoionization detector

TABLE 3-2
PID MEASUREMENTS AT VAPOR MONITORING POINTS (VMPs)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tenessee

VMP ID[2]	Closest SVE Well	Distance from Closest SVE Well (ft)	PID[1] Measurement (ppm)										
			7/20/2007[3]	11/29/2007[4]	12/6/2007[4]	01/11/08[4]	01/24/08[4]	02/22/08[4]	03/20/08[4] [5]	04/03/08[4]	04/10/08[4]	04/17/08[4]	07/16/08[4]
VMP-1A	SVE-A	15.06	4,783	0.1	1.7	0.0	0.0	0.0	0.0	N/C	N/C	1.3	1.3
VMP-1B	SVE-A	21.04	3,194	4.3	0.3	0.9	1.3	0.2	0.0	N/C	N/C	16.0	2.0
VMP-2A	SVE-B	30.68	1,078	1.2	0.8	0.2	0.6	0.0	0.0	0.0	0.5	0.5	0.6
VMP-2B	SVE-B	37.47	>10,000[6]	34.5	22.7	316	143	0.0	42.2	217	135	316	713
VMP-3A	SVE-C	30.68	103	1.2	1.8	0.5	0.7	0.4	0.0	N/C	N/C	0.8	1.8
VMP-3B	SVE-C	25.52	4,509	847	619	398	645	50.0	1.47	N/C	N/C	43.4	>10,000[6]
VMP-4A	SVE-C	59.99	98.2	1.7	1.4	0.2	0.6	0.7	0.0	N/C	N/C	1.4	2.3
VMP-4B	SVE-C	59.53	386	68.6	62.2	23.1	23.2	37.7	0.0	N/C	N/C	9.9	6.0
VMP-5A	SVE-D	30.99	1,484	4.4	3.5	1.7	2	2.63	0.5	N/C	N/C	9.9	5.0
VMP-5B	SVE-D	31.05	82.3	94.1	79.2	54.2	56.3	28.9	12.6	N/C	N/C	7.0	606
VMP-6A	SVE-E	45.01	989	15.4	11.5	4.17	3.6	7.4	0.0	0.0	0.0	0.2	2.3
VMP-6B	SVE-E	45.04	3,320	482	459	666	470	1,277	406	302	85.5	112	2,990
VMP-7A	SVE-F	15.30	14.6	2.2	1.8	0.1	0.2	1.7	0.0	0.0	0.3	3.6	3.7
VMP-7B	SVE-F	15.23	11.7	3.9	3.1	3.0	2.1	3.9	1.1	0.0	0.0	3.9	55.6
VMP-8A	SVE-F	80.41	450	0.3	0.4	0.0	0.2	1.6	0.0	0.0	0.0	0.7	4.6
VMP-8B	SVE-F	80.17	80.6	28.8	33.3	7.2	5.0	5.1	0.5	19.7	1.2	4.4	16.8
VMP-9A	SVE-G	45.19	2.3	1.2	1.2	1.3	0.7	1.9	0.0	N/C	N/C	2.7	4.1
VMP-9B	SVE-G	45.18	84.3	119	126	54.3	49.4	51.3	11.3	N/C	N/C	23.1	2.6
VMP-10A	SVE-G	60.08	2.1	0.4	0.3	0.1	0.1	0.7	0.0	N/C	N/C	0.7	3.2
VMP-10B	SVE-G	60.50	27.2	2.8	3.8	11.1	18.8	27.4	3.73	N/C	N/C	2.2	2.3

(1) Photo Ionization Detector (PID) manufactured by RAE Systems (Model: MiniRAE 2000) with a 10.6 eV lamp.
(2) All VMP wells contain 5-foot screen lengths. VMP "A" wells (e.g., VMP-1A) were constructed with a screen located near the bottom of the screen of the assocated SVE well. VMP "B" wells (e.g., VMP-1B) were constructed with a screen located near the top of the screen of the assocated SVE well.
(3) Measurements collected prior to system startup.
(4) Measurements collected while system offline. System offine for two hours prior to collection of PID readings.
(5) Measurements collected prior to shut down of SVE wells as part of rebound study.
(6) Influent stream exceeded maxium range of PID meter (10,000 ppm).
N/C - Rebound Event #1 occurred from 3/20/08 to 04/17/08. PID readings only collected on VMPs assoicated with those offline weel.s No PID readings collected from VMP-1A/B, VMP-3A/B, VMP-4A/B, VMP-5A/B, VMP-9A/B, and VMP-10A/B.
ppm: parts per million

TABLE 4-1
ANALYTICAL RESULTS SUMMARY – SVE WELLS AND SYSTEM (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF	SVE-MID	SVE-EFF
	Date	RG	7/25/2007	7/25/2007	7/25/2007	7/25/2007	7/25/2007	7/25/2007	7/25/2007	7/25/2007	7/25/2007	7/25/2007
Primary VOCs	Units											
1,1,2,2-Tetrachloroethane	ppb v/v	0.55	410	230	110000	140000	<3800	150	2600 J	290000	1.8	0.58
1,1,2-Trichloroethane	ppb v/v	2.03	<330	2.8 J	6600	<2500	<3800	<7.9	<2800	4200	<0.2	<0.2
1,1-Dichloroethene	ppb v/v	29.03	220 J	<4	<6100	<2500	<3800	<7.9	<2800	<2300	<0.2	<0.2
1,2-Dichloroethane	ppb v/v	0.64	270 J	<4	2400 J	<2500	4600	11	<2800	670 J	<0.2	<0.2
Carbon tetrachloride	ppb v/v	14.22	720	5.9	<6100	<2500	<3800	3.2 J	37000	4900	<0.2	<0.2
Chloroform	ppb v/v	32.63	850	52	4400 J	530 J	<3800	32	610000	53000	<0.2	<0.2
cis-1,2-Dichloroethene	ppb v/v	39.52	10000	210	450000	10000	5500 J	130	5500	220000	<0.3	<0.3
Methylene chloride	ppb v/v	2.85	130 J,B	29 B	2200 J,B	990 J,B	1200 J,B	2.1 J,B	1000 J,B	790 J,B	0.74 B	0.15 J,B
Tetrachloroethene	ppb v/v	0.99	590	16	10000	18000	5700	10	13000	19000	0.07 J	<0.2
trans-1,2-Dichloroethene	ppb v/v	133.5	--	--	--	--	--	--	--	--	--	--
Trichloroethene	ppb v/v	2.06	38000	960 B	B	740000 B	320000	670	260000	670000 B	0.88	0.61 B
Vinyl chloride	ppb v/v	14.77	<330	<4	<6100	<2500	<3800	<7.9	<2800	1300 J	<0.2	<0.2
Additional VOCs*												
1,4-Dichlorobenzene	ppb v/v	NA	<330	<4	<6100	<2500	<3800	<7.9	<2800	<2300	0.087 J	0.24
Benzene	ppb v/v	NA	<330	<4	<6100	<2500	<3800	<7.9	<2800	<2300	2.3	0.66
Chlorobenzene	ppb v/v	NA	<330	<4	<6100	<2500	<3800	<7.9	<2800	<2300	0.2	<0.2
Chloromethane	ppb v/v	NA	<830	<10	<15000	<6200	<9500	<20	<6900	<5700	0.58	<0.5
Ethylbenzene	ppb v/v	NA	<330	<4	<6100	<2500	<3800	<7.9	<2800	<2300	1	0.36
m-Xylene & p-Xylene	ppb v/v	NA	<330	<4	<6100	<2500	<3800	<7.9	<2800	<2300	5.4	1.7
o-Xylene	ppb v/v	NA	<330	<4	<6100	<2500	<3800	<7.9	<2800	<2300	3.2	0.88
Toluene	ppb v/v	NA	<330	<4	<6100	<2500	<3800	<7.9	<2800	<2300	0.54	0.79
Total VOCs**			**51190**	**1506**	**1885600**	**909520**	**337000**	**1008**	**929100**	**1263860**	**17.1**	**6.15**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-2
ANALYTICAL RESULTS SUMMARY – VAPOR MONITORING POINTS (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	VMP-01A	VMP-01B	VMP-02A	VMP-02B	VMP-03A	VMP-03B	VMP-04A	VMP-04B	VMP-05A	VMP-05B
	Date	RG	7/25/2007	7/25/2007	7/25/2007	7/25/2007	7/24/2007	7/24/2007	7/24/2007	7/24/2007	7/24/2007	7/24/2007
Primary VOCs	Units											
1,1,2,2-Tetrachloroethane	ppb v/v	0.55	<410	<390	54 J	<1200	<580	<11000	190 J	<1200	110000	<420
1,1,2-Trichloroethane	ppb v/v	2.03	<410	<390	<110	<1200	<580	<11000	<400	<1200	<6200	<420
1,1-Dichloroethene	ppb v/v	29.03	240 J	180 J	43 J	1800	<580	<11000	<400	<1200	<6200	<420
1,2-Dichloroethane	ppb v/v	0.64	<410	<390	<110	<1200	<580	<11000	<400	<1200	<6200	<420
Carbon tetrachloride	ppb v/v	14.22	450	220 J	<110	<1200	<580	<11000	<400	<1200	<6200	<420
Chloroform	ppb v/v	32.63	*1100*	180 J	<110	830 J	220 J	3300 J	230 J	850 J	<6200	<420
cis-1,2-Dichloroethene	ppb v/v	39.52	21000	7000	4800	240000	25000	570000	23000	100000	40000	1000
Methylene chloride	ppb v/v	2.85	190 J,B	190 J,B	59 J,B	580 J,B	340 J,B	4200 J,B	190 J,B	470 J,B	2000 J,B	160 J,B
Tetrachloroethene	ppb v/v	0.99	860	550	48 J	1600	760	27000	750	3000	39000	1300
trans-1,2-Dichloroethene	ppb v/v	133.5	--	--	--	--	--	--	--	--	--	--
Trichloroethene	ppb v/v	2.06	67000	40000	13000	460000 B	81000	2700000	64000	330000	2500000 B	66000
Vinyl chloride	ppb v/v	14.77	<410	<390	98 J	4500	<580	<11000	<400	<1200	<6200	<420
Additional VOCs*												
None Detected above RL												
Total VOCs**			**91010**	**48320**	**18190**	**709310**	**107780**	**3304500**	**88360**	**434320**	**2691000**	**68460**

Notes:

B: Method Blank Contamination

J: Estimate

<: Result is less than laboratory detection limit.

Units: ppb v/v: parts per billion volume per volume

--: Not Analyzed

* Detected above RL

** Sum of all VOCs

TABLE 4-2
ANALYTICAL RESULTS SUMMARY – VAPOR MONITORING POINTS (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	VMP-06A	VMP-06B	VMP-07A	VMP-07B	VMP-08A	VMP-08B	VMP-09A	VMP-09B	VMP-10A	VMP-10B
	Date	RG	7/24/2007	7/24/2007	7/24/2007	7/24/2007	7/25/2007	7/23/2007	7/23/2007	7/23/2007	7/23/2007	7/23/2007
Primary VOCs	Units											
1,1,2,2-Tetrachloroethane	ppb v/v	0.55	4000	310000	78	14 J	57	3000	<2.9	950 J	4.9 J	83 J
1,1,2-Trichloroethane	ppb v/v	2.03	<3000	<3000	49	14 J	21 J	400	<2.9	<1200	<7.2	<220
1,1-Dichloroethene	ppb v/v	29.03	<3000	<3000	<40	14 J	<31	<320	1.9 J	<1200	<7.2	<220
1,2-Dichloroethane	ppb v/v	0.64	<3000	<3000	<40	<31	<31	240 J	<2.9	<1200	28 J	<220
Carbon tetrachloride	ppb v/v	14.22	<3000	<3000	410	<31	<31	930	360	60000	420	15000
Chloroform	ppb v/v	32.63	<3000	<3000	290	410	160	1400	2700	190000	920	56000
cis-1,2-Dichloroethene	ppb v/v	39.52	11000	16000	5900	4700	910	7400	46	2800	10 J	420
Methylene chloride	ppb v/v	2.85	990 J,B	1100 J,B	29 J,B	19 J,B	26 J,B	240 J,B	1.4 J,B	2100 J,B	3.7 J,B	210 J,B
Tetrachloroethene	ppb v/v	0.99	12000	21000	37 J	82	32	810	4.7	16000	53	3000
trans-1,2-Dichloroethene	ppb v/v	133.5	--	--	--	--	--	--	--	--	--	--
Trichloroethene	ppb v/v	2.06	880000	1300000 B	6300 B	6300 B	4800 B	40000	590 B	97000 B	710	27000 B
Vinyl chloride	ppb v/v	14.77	<3000	<3000	100	64	36	330	1.1 J	<1200	<7.2	<220
Additional VOCs*												
None Detected above RL												
Total VOCs**			**907990**	**1648100**	**13224**	**11636**	**6063**	**54750**	**3705**	**368850**	**2150**	**101713**

Notes:

B: Method Blank Contamination

J: Estimate

<: Result is less than laboratory detection limit.

Units: ppb v/v: parts per billion volume per volume

--: Not Analyzed

* Detected above RL

** Sum of all VOCs

TABLE 4-3
ANALYTICAL RESULTS SUMMARY – SVE SYSTEM (BASELINE EVENTS #2 AND #3)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-INF	SVE-INF	SVE-MID	SVE-MID	SVE-EFF	SVE-EFF
	Date	RG	8/3/2007	8/16/2007	8/3/2007	8/16/2007	8/3/2007	8/16/2007
Primary VOCs	Units							
1,1,2,2-Tetrachloroethane	ppb v/v	0.55	14000	25000	<1800	0.21	<1100	<0.2
1,1,2-Trichloroethane	ppb v/v	2.03	390 J	370 J	<1800	<0.2	<1100	<0.2
1,1-Dichloroethene	ppb v/v	29.03	<580	<490	<1800	<0.2	<1100	<0.2
1,2-Dichloroethane	ppb v/v	0.64	180 J,B	<490	630 J,B	<0.2	360 J,B	<0.2
Carbon tetrachloride	ppb v/v	14.22	<580	590	2300	<0.2	<1100	<0.2
Chloroform	ppb v/v	32.63	14000	9800	20000	3.7	37000	0.87
cis-1,2-Dichloroethene	ppb v/v	39.52	20000	12000	26000	10	170000	2.8
Methylene chloride	ppb v/v	2.85	310 J,B	170 J,B	560 J,B	5.4 B	610 J,B	0.071 J,B
Tetrachloroethene	ppb v/v	0.99	1700	1400	<1800	0.22	<1100	0.71
trans-1,2-Dichloroethene	ppb v/v	133.5	--	--	--	--	--	--
Trichloroethene	ppb v/v	2.06	70000 B	51000	180000 B	28	650 J,B	0.26
Vinyl chloride	ppb v/v	14.77	<580	320 J,B	<1800	33 B	<1100	24 B
Additional VOCs*								
Benzene	ppb v/v	NA	<580	<490	<1800	0.42	<1100	<0.2
Dichlorodifluoromethane	ppb v/v	NA	<580	<490	<1800	0.53	<1100	0.5
Ethylbenzene	ppb v/v	NA	<580	<490	<1800	1.2	<1100	0.14 J
m-Xylene & p-Xylene	ppb v/v	NA	<580	<490	<1800	7.1	<1100	0.79
o-Xylene	ppb v/v	NA	<580	<490	<1800	6.4	<1100	0.66
Toluene	ppb v/v	NA	220 J	<490	<1800	0.15 J	<1100	0.088 J
Total VOCs**	ppb v/v		**120800**	**100650**	**229490**	**96.7**	**208620**	**31.5**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-4
ANALYTICAL RESULTS SUMMARY – SVE WELLS AND SYSTEM (BASELINE EVENT #4)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF
	Date	RG	8/23/2007	8/23/2007	8/23/2007	8/23/2007	8/23/2007	8/23/2007	8/23/2007	8/23/2007
Primary VOCs	Units									
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	13	14	23000	26000	35	12	13000	8500
1,1,2-Trichloroethane	ppb(v/v)	2.03	<4.9	0.15 J	620	<250	<7.1	0.12 J	470	110 J
1,1-Dichloroethene	ppb(v/v)	29.03	51	<0.2	<430	<250	<7.1	<0.2	<320	<130
1,2-Dichloroethane	ppb(v/v)	0.64	<4.9	<0.2	110 J	<250	<7.1	<0.2	<320	<130
Carbon tetrachloride	ppb(v/v)	14.22	480	0.94	<430	<250	5.5 J	0.88	10000	750
Chloroform	ppb(v/v)	32.63	1600 J	4.7	330 J	110 J	6.8 J	4.2	94000	4000
cis-1,2-Dichloroethene	ppb(v/v)	39.52	210	4.1	17000	1600	28	3.8	1400	3500
Methylene chloride	ppb(v/v)	2.85	1.8 J	0.13 J	190 J	160 J	<18	0.15 J	280 J	120 J
Tetrachloroethene	ppb(v/v)	0.99	120	0.72	1000	1500	4.8 J	0.62	2800	530
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	700	17	37000	37000	540	15	27000	14000
Vinyl chloride	ppb(v/v)	14.77	220 B	4.2 B	1400 B	820 B	25 B	2 B	770 B	280 B
Additional VOCs*										
Chloromethane	ppb(v/v)	NA	6 J	0.54	<1100	<630	<18	0.81	<810	<340
Dichlorodifluoromethane	ppb(v/v)	NA	6	0.5	<430	<250	<7.1	0.57	<320	<130
Ethylbenzene	ppb(v/v)	NA	<4.9	0.075 J	<430	<250	<7.1	0.083 J	<320	<130
m-Xylene & p-Xylene	ppb(v/v)	NA	<4.9	0.31	<430	<250	<7.1	0.29	<320	<130
o-Xylene	ppb(v/v)	NA	<4.9	0.1 J	<430	<250	<7.1	0.095 J	<320	<130
Toluene	ppb(v/v)	NA	<4.9	0.31	<430	<250	<7.1	0.25	<320	<130
Trichlorofluoromethane	ppb(v/v)	NA	1.1 J	0.27	59 J	60 J	<7.1	0.28	76 J	31 J
Total VOCs**	ppb(v/v)		3409	48.3	80709	67250	645	41.4	149796	31821

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-4
ANALYTICAL RESULTS SUMMARY – SVE WELLS AND SYSTEM (BASELINE EVENT #4)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-MID	SVE-EFF
	Date	RG	8/23/2007	8/23/2007
Primary VOCs	Units			
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	<660	0.58
1,1,2-Trichloroethane	ppb(v/v)	2.03	<660	<0.2
1,1-Dichloroethene	ppb(v/v)	29.03	<660	<0.2
1,2-Dichloroethane	ppb(v/v)	0.64	<660	<0.2
Carbon tetrachloride	ppb(v/v)	14.22	2100	0.038 J
Chloroform	ppb(v/v)	32.63	10000	1.5
cis-1,2-Dichloroethene	ppb(v/v)	39.52	7700	8.1
Methylene chloride	ppb(v/v)	2.85	260 J	3.3
Tetrachloroethene	ppb(v/v)	0.99	<660	0.08 J
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--
Trichloroethene	ppb(v/v)	2.06	42000	1.6
Vinyl chloride	ppb(v/v)	14.77	2300 B	26 B
Additional VOCs*				
Chloromethane	ppb(v/v)	NA	<1600	0.16 J
Dichlorodifluoromethane	ppb(v/v)	NA	<660	0.34
Ethylbenzene	ppb(v/v)	NA	<660	0.091 J
m-Xylene & p-Xylene	ppb(v/v)	NA	<660	0.49
o-Xylene	ppb(v/v)	NA	<660	0.4
Toluene	ppb(v/v)	NA	<660	0.16 J
Trichlorofluoromethane	ppb(v/v)	NA	<660	0.05 J
Total VOCs**	ppb(v/v)		64360	43.1

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-5
ANALYTICAL RESULTS SUMMARY – SVE WELLS AND SYSTEM (BASELINE EVENT #5)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF	SVE-MID	SVE-EFF
	Date	RG	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007
Primary VOCs	Units											
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	4.4 J	1.9	1900	81	740	0.95	4000	610	83 J	70 J
1,1,2-Trichloroethane	ppb(v/v)	2.03	<7.5	<0.2	<80	<2.9	<30	<0.2	79 J	<96	<170	<170
1,1-Dichloroethene	ppb(v/v)	29.03	270	0.11 J	<80	<2.9	<30	0.13 J	<80	100	110 J	80 J
1,2-Dichloroethane	ppb(v/v)	0.64	4.2 J	<0.2	<80	<2.9	<30	<0.2	24 J	<96	<170	<170
Carbon tetrachloride	ppb(v/v)	14.22	1400	0.8	<80	0.54 J	33	0.91	4400	530	610	790
Chloroform	ppb(v/v)	32.63	7200	3.8	76 J	6.3	30	4.6	22000	2300	2500	3100
cis-1,2-Dichloroethene	ppb(v/v)	39.52	240	4.7	2700	26	340	5.8	260	2400	2400	3200
Methylene chloride	ppb(v/v)	2.85	2.4 J	0.15 J	250	<7.1	<74	0.26 J	110 J	52 J	110 J	130 J
Tetrachloroethene	ppb(v/v)	0.99	420	0.21	190	9.7	63	0.2	1300	260	<170	<170
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--	--	--	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	1600	15	7300	370	5200	19	5900	8500	16000	12000
Vinyl chloride	ppb(v/v)	14.77	3.4 J	0.12 J	<80	<2.9	<30	0.18 J	<80	100	130 J	120 J
Additional VOCs*												
Chloromethane	ppb(v/v)	NA	<19	0.71	<200	<7.1	<74	0.89	<200	<240	<430	<430
Dichlorodifluoromethane	ppb(v/v)	NA	<7.5	0.5	<80	<2.9	<30	0.53	<80	<96	<170	<170
Toluene	ppb(v/v)	NA	<7.5	0.3	<80	<2.9	<30	0.23	<80	82 J	54 J	<170
Trichlorofluoromethane	ppb(v/v)	NA	1.1 J	0.23	<80	<2.9	<30	0.25	<80	<96	<170	<170
Total VOCs**	ppb(v/v)		**11149**	**29.0**	**12416**	**494**	**6406**	**34.2**	**38073**	**14993**	**21997**	**19490**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-6
ANALYTICAL RESULTS SUMMARY – SVE WELLS AND SYSTEM (4Q07 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF
	Date	RG	10/18/2007	10/18/2007	10/18/2007	10/18/2007	10/18/2007	10/18/2007	10/18/2007	10/18/2007
Primary VOCs	Units									
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	14	3.3	3200	3700	3.1	2.8	1100	3100
1,1,2-Trichloroethane	ppb(v/v)	2.03	1.7 J	<0.2	<200	<60	<0.2	<0.2	16 J	<100
1,1-Dichloroethene	ppb(v/v)	29.03	130	<0.2	<200	<60	<0.2	<0.2	<21	110
1,2-Dichloroethane	ppb(v/v)	0.64	2.5	<0.2	<200	<60	<0.2	<0.2	<21	<100
Carbon tetrachloride	ppb(v/v)	14.22	680	0.36	<200	<60	0.33	0.32	1400	380
Chloroform	ppb(v/v)	32.63	4200	1.6	110 J	35 J	1.4	1.5	6200	2000
cis-1,2-Dichloroethene	ppb(v/v)	39.52	120	1.2	3300	210	1.1	1	73	1600
Methylene chloride	ppb(v/v)	2.85	1 J,B	0.2 J,B	110 J,B	34 J,B	0.34 J,B	0.37 J,B	31 J,B	72 J,B
Tetrachloroethene	ppb(v/v)	0.99	260	0.78	340	450	0.73	0.86	390	470
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	1100	6	16000	4600	5.5	5.3	1500	8100
Vinyl chloride	ppb(v/v)	14.77	<2.3	0.095 J	<200	21 J	0.095 J	0.1 J	<21	91 J
Additional VOCs*										
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	NA	<2.3	0.18 J	<200	<60	0.18 J	0.19 J	<21	170
Chloromethane	ppb v/v	NA	<5.7	0.73	<510	<150	0.83	0.96	<53	<250
Dichlorodifluoromethane	ppb v/v	NA	<2.3	0.43	<200	<60	0.48	0.47	<21	<100
Ethylbenzene	ppb v/v	NA	<2.3	0.5	<200	<60	0.49	0.5	<21	<100
m-Xylene & p-Xylene	ppb v/v	NA	<2.3	1.6	<200	<60	1.7	1.8	<21	<100
o-Xylene	ppb v/v	NA	<2.3	0.51	<200	<60	0.53	0.54	<21	<100
Styrene	ppb v/v	NA	<2.3	<0.2	<200	<60	<0.2	<0.2	<21	<100
Toluene	ppb v/v	NA	<2.3	0.38	<200	<60	0.42	0.43	<21	<100
Trichlorofluoromethane	ppb v/v	NA	0.33 J	0.2	<200	<60	0.23	0.22	<21	<100
Total VOCs**	ppb v/v		**6514**	**18.2**	**23060**	**9050**	**17.6**	**17.6**	**10710**	**16119**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-7
ANALYTICAL RESULTS SUMMARY – SVE WELLS AND SYSTEM (1Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF
	Date	RG	1/17/2008	1/17/2008	1/17/2008	1/17/2008	1/17/2008	1/17/2008	1/17/2008	1/17/2008
Primary VOCs	Units									
1,1,2,2-Tetrachloroethane	ppb v/v	0.55	730	10	410	4500	14	9.9	450	1000
1,1,2-Trichloroethane	ppb v/v	2.03	<50	<0.8	<170	<40	<0.8	<8	<330	<95
1,1-Dichloroethene	ppb v/v	29.03	55	0.67 J	<170	<40	0.7 J	<8	<330	110
1,2-Dichloroethane	ppb v/v	0.64	<50	<0.8	<170	<40	<0.8	<8	<330	<95
Carbon tetrachloride	ppb v/v	14.22	850	2.2	<170	<40	2.5	2.4 J	1500	340
Chloroform	ppb v/v	32.63	5300	16	60 J	38 J	17	21	32000	3100
cis-1,2-Dichloroethene	ppb v/v	39.52	140	17	2100	140	18	22	210 J	3500
Methylene chloride	ppb v/v	2.85	30 J,B	0.63 J,B	310 J,B	17 J,B	0.62 J,B	4.7 J,B	270 J,B	100 J,B
Tetrachloroethene	ppb v/v	0.99	190	2.5	170	300	3.5	860	1100	330
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--	--	--	--	--
Trichloroethene	ppb v/v	2.06	720	51	13000	3100	68	68	5500	11000
Vinyl chloride	ppb v/v	14.77	<50	1.6	<170	<40	2.1	<8	<330	290
Additional VOCs*										
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	NA	<50	0.83	<170	<40	0.95	<8	<330	160
Benzene	ppb v/v	NA	<50	0.53 J	<170	<40	0.91	<8	<330	29 J
Total VOCs**	ppb v/v		**8015**	**104**	**16050**	**8095**	**130**	**988**	**41380**	**20019**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-8
ANALYTICAL RESULTS SUMMARY – SVE WELLS AND SYSTEM (2Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF
	Date	RG	4/24/2008	4/24/2008	4/24/2008	5/6/2008	4/24/2008	4/24/2008	4/24/2008	4/24/2008
	Units									
Primary VOCs										
1,1,2,2-Tetrachloroethane	ppb v/v	0.55	76	1.5	500	4300	2.7	<0.2	9.5	1800
1,1,2-Trichloroethane	ppb v/v	2.03	<2	<0.2	<99	5.3 J	0.21	<0.2	0.06 J	24 J
1,1-Dichloroethene	ppb v/v	29.03	6.3	<0.2	31 J	<19	0.096 J	0.056 J	<0.2	120
1,2-Dichloroethane	ppb v/v	0.64	<2	<0.2	<99	<19	<0.2	<0.2	<0.2	<54
Carbon tetrachloride	ppb v/v	14.22	76	0.12 J	<99	<19	1.3	0.13 J	0.17 J	160
Chloroform	ppb v/v	32.63	4800	0.48	170	7 J	5.1	0.47	6.3	2200
cis-1,2-Dichloroethene	ppb v/v	39.52	21	1.3	2500	110	11	0.64	0.72	3100
Methylene chloride	ppb v/v	2.85	1.1 J,B	0.52 B	180 J,B	18 J,B	0.35 J,B	0.65	0.71	27 J,B
Tetrachloroethene	ppb v/v	0.99	22	0.062 J	180	190	2	<0.2	0.29	170
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--	--	--	--	--
Trichloroethene	ppb v/v	2.06	94	2	13000	2600	120	1.1	3.5	7400
Vinyl chloride	ppb v/v	14.77	<2	<0.2	<99	<19	0.075 J	<0.2	<0.2	180
Additional VOCs*										
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	NA	<2	0.13 J	<99	<19	0.12 J	0.13 J	0.11 J	74
1,2,4-Trimethylbenzene	ppb v/v	NA	<2	0.19 J	<99	<19	0.15 J	<0.2	0.14 J	<54
1,4-Dichlorobenzene	ppb v/v	NA	<2	0.1 J	<99	<19	0.25	<0.2	<0.2	<54
Benzene	ppb v/v	NA	<2	0.69	34 J	<19	0.81	0.23	0.7	<54
Chloromethane	ppb v/v	NA	<5	0.8	<250	<47	0.94	1.1	0.96	<140
Dichlorodifluoromethane	ppb v/v	NA	<2	0.65	<99	<19	0.71	0.67	0.62	<54
m-Xylene & p-Xylene	ppb v/v	NA	<2	0.56	<99	<19	0.57	<0.2	0.58	<54
o-Xylene	ppb v/v	NA	<2	0.22	<99	<19	0.22	<0.2	0.23	<54
Toluene	ppb v/v	NA	<2	0.97	31 J	5.2 J	1	0.072 J	1	<54
Trichlorofluoromethane	ppb v/v	NA	<2	0.3	<99	<19	0.35	0.29	0.27	<54
Total VOCs**	ppb v/v		**5097**	**10.8**	**16626**	**7236**	**148**	**5.58**	**26.2**	**15280**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-9
ANALYTICAL RESULTS SUMMARY – SVE WELLS AND SYSTEM (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF
	Date	RG	8/14/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008
Primary VOCs	Units									
1,1,2,2-Tetrachloroethane	ppb v/v	0.55	4.4	9.8	20000	14000	7.2	9.4	420	2700
1,1,2-Trichloroethane	ppb v/v	2.03	<2	<2	210	<240	<2	<2	8.9	25 J
1,1-Dichloroethene	ppb v/v	29.03	<2	<2	<58	<240	0.42 J	0.37 J	6.4	58 J
1,2-Dichloroethane	ppb v/v	0.64	<2	<2	37 J	<240	<2	<2	3.7 J	<62
Carbon tetrachloride	ppb v/v	14.22	<2	<2	<58	<240	<2	<2	72	15 J
Chloroform	ppb v/v	32.63	6.7	1.9 J	160	<240	1.6 J	1.6 J	2000	420
cis-1,2-Dichloroethene	ppb v/v	39.52	1.2 J	6	4000	880	5.2	5.7	47	1400
Methylene chloride	ppb v/v	2.85	3.2 J,B	1.5 J,B	31 J,B	210 J,B	1.4 J,B	1.9 J,B	31 B	77 J,B
Tetrachloroethene	ppb v/v	0.99	1.9 J	0.55 J	59	670	0.49 J	0.46 J	27	140
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--	--	--	--	--
Trichloroethene	ppb v/v	2.06	13	24	13000	28000	24	24	600	6800
Vinyl chloride	ppb v/v	14.77	<2	<2	<58	<240	<2	<2	3.8 J	97
Additional VOCs*										
None Detected above RL										
Total VOCs**			**32.6**	**45.2**	**37497**	**43760**	**41.0**	**45.2**	**3231**	**11795**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-10
ANALYTICAL RESULTS SUMMARY – VAPOR MONITORING POINTS (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	VMP-01A	VMP-01B	VMP-02A	VMP-02B	VMP-03A	VMP-03B	VMP-04A	VMP-04B	VMP-05A
	Date	RG	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/17/2008
Primary VOCs	Units										
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	<2	6.9	<7.8	1900 J	15	<3400	7.8	<12	97
1,1,2-Trichloroethane	ppb(v/v)	2.03	<2	2.2	<7.8	1600 J	<7.3	<3400	<2	4.2 J	<2
1,1-Dichloroethene	ppb(v/v)	29.03	1.9 J	1.1 J	95	18000	<7.3	3000 J	<2	7.3 J	<2
1,2-Dichloroethane	ppb(v/v)	0.64	<2	0.77 J	<7.8	<5300	<7.3	<3400	<2	<12	<2
Carbon tetrachloride	ppb(v/v)	14.22	<2	<2	<7.8	<5300	1.6 J	<3400	<2	<12	<2
Chloroform	ppb(v/v)	32.63	15	7.1	<7.8	1500 J	5.8 J	7000	58	38	0.85 J
cis-1,2-Dichloroethene	ppb(v/v)	39.52	1.2 J	60	33	910000	96	1600000	140	2000	5.4
Methylene chloride	ppb(v/v)	2.85	2 J,B	2.9 J,B	8.1 J,B	3600 J,B	6.2 J,B	2500 J,B	2.5 J,B	12 J,B	2.7 J,B
Tetrachloroethene	ppb(v/v)	0.99	3	58	1.7 J	2000 J	9.1	50000	2.6	81	1.9 J
trans-1,2-Dichloroethene	ppb v/v	133.5	--	--	--	--	--	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	4.3	44	40	330000	1200	5800000	85	710	200
Vinyl chloride	ppb(v/v)	14.77	<2	<2	9.6	400000	3.1 J	<3400	<2	<12	<2
Additional VOCs*											
1,1,1-Trichloroethane	ppb(v/v)	NA	<2	<2	15	<5300	<7.3	<3400	<2	<12	<2
trifluoroethane	ppb(v/v)	NA	1 J	<2	1100	<5300	<7.3	<3400	<2	<12	<2
Benzene	ppb(v/v)	NA	<2	3.2	<7.8	4400 J	<7.3	1100 J	<2	21	0.68 J
Dichlorodifluoromethane	ppb(v/v)	NA	<2	<2	<7.8	<5300	<7.3	<3400	<2	<12	<2
Ethylbenzene	ppb(v/v)	NA	<2	1.1 J	<7.8	<5300	<7.3	<3400	<2	<12	<2
Toluene	ppb(v/v)	NA	<2	1.9 J	<7.8	<5300	<7.3	<3400	<2	13	1.1 J
Trichlorofluoromethane	ppb(v/v)	NA	0.27 J	0.28 J	20	<5300	<7.3	<3400	0.27 J	<12	0.36 J
Total VOCs**			**28.7**	**191**	**1330**	**1673000**	**1337**	**7463600**	**296**	**2887**	**310**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-10
ANALYTICAL RESULTS SUMMARY – VAPOR MONITORING POINTS (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	VMP-05B	VMP-06A	VMP-06B	VMP-07A	VMP-07B	VMP-08A	VMP-08B	VMP-09A	VMP-09B	VMP-10A	VMP-10B
	Date	RG	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008
Primary VOCs	Units												
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	970 J	680	4800000	9.5	32	3.2	2300	5.9 J	6.4	0.92 J	5400
1,1,2-Trichloroethane	ppb(v/v)	2.03	<2200	2.6 J	4000	0.82 J	8.5 J	<2	150	<7.9	<3.6	<2	700
1,1-Dichloroethene	ppb(v/v)	29.03	<2200	<4.4	<2300	<2	7.3 J	1.6 J	22 J	99	60	2.9	<63
1,2-Dichloroethane	ppb(v/v)	0.64	<2200	<4.4	<2300	<2	<9.7	<2	<50	<7.9	<3.6	<2	<63
Carbon tetrachloride	ppb(v/v)	14.22	<2200	<4.4	<2300	1.5 J	410	1.6 J	24 J	750	450	67	18 J
Chloroform	ppb(v/v)	32.63	670 J	1.6 J	<2300	38	350	0.94 J	350	1100	480	5.9	260
cis-1,2-Dichloroethene	ppb(v/v)	39.52	11000	14	23000	18	770	1.6 J	2500	25	9.3	<3	<94
Methylene chloride	ppb(v/v)	2.85	1900 J,B	2.3 J,B	1400 J,B	1.4 J,B	7.8 J,B	1.9 J,B	22 J,B	4 J,B	3.5 J,B	1.8 J,B	67 J,B
Tetrachloroethene	ppb(v/v)	0.99	16000	0.99 J	31000	0.6 J	56	3.3	180	190	110	4.7	23 J
trans-1,2-Dichloroethene	ppb v/v	133.5	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	540000	540	3500000	16	1900	5.2	11000	2400	1000	2.7	530
Vinyl chloride	ppb(v/v)	14.77	<2200	<4.4	<2300	<2	23	<2	92	<7.9	<3.6	<2	<63
Additional VOCs*													
1,1,1-Trichloroethane	ppb(v/v)	NA	<2200	<4.4	<2300	<2	<9.7	<2	<50	1.4 J	0.86 J	<2	<63
trifluoroethane	ppb(v/v)	NA	<2200	<4.4	<2300	<2	<9.7	<2	<50	<7.9	<3.6	1.4 J	<63
Benzene	ppb(v/v)	NA	2000 J	<4.4	<2300	1.8 J	20	<2	17 J	2.6 J	110	<2	<63
Dichlorodifluoromethane	ppb(v/v)	NA	<2200	<4.4	<2300	<2	<9.7	1.6 J	<50	46	37	<2	<63
Ethylbenzene	ppb(v/v)	NA	<2200	<4.4	<2300	<2	<9.7	<2	<50	<7.9	20	<2	<63
Toluene	ppb(v/v)	NA	3900	<4.4	<2300	<2	3 J	<2	<50	<7.9	28	<2	<63
Trichlorofluoromethane	ppb(v/v)	NA	<2200	<4.4	<2300	0.25 J	<9.7	0.51 J	<50	3.2 J	2.3 J	0.33 J	<63
Total VOCs**			**576440**	**1241**	**8359400**	**87.9**	**3588**	**21.5**	**16675**	**4627**	**2322**	**87.7**	**6998**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-11
ANALYTICAL RESULTS SUMMARY – SVE WELLS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Primary VOCs	Location Date Units	Fluvial Soil RG	SVE-B 4/3/2008	SVE-E 4/3/2008	SVE-F 4/3/2008	SVE-B 4/18/2008	SVE-E 4/18/2008	SVE-F 4/18/2008
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	2.3	0.82	2.4	1.9	0.47	0.53
1,1,2-Trichloroethane	ppb(v/v)	2.03	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethene	ppb(v/v)	29.03	0.07 J	0.058 J	0.064 J	0.043 J	0.055 J	0.049 J
1,2-Dichloroethane	ppb(v/v)	0.64	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon tetrachloride	ppb(v/v)	14.22	0.25	0.19 J	0.24	0.15 J	0.2	0.19 J
Chloroform	ppb(v/v)	32.63	0.75	0.55	1.1	0.6	0.65	0.71
cis-1,2-Dichloroethene	ppb(v/v)	39.52	6.4	1.6	2.1	2.7	1.8	2.1
Methylene chloride	ppb(v/v)	2.85	0.26 J	0.26 J	0.38 J	0.27 J,B	0.47 J,B	0.31 J,B
Tetrachloroethene	ppb(v/v)	0.99	0.19 J	0.12 J	0.18 J	0.12 J	0.089 J	0.12 J
trans-1,2-Dichloroethene	ppb v/v	133.5	--	--	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	7.8	3.4	4.8	5.6	4.8	5.2
Vinyl chloride	ppb(v/v)	14.77	0.47	0.29	0.35	0.21	0.25	0.24
Additional VOCs*								
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	NA	0.21	0.19 J	0.22	0.17 J	0.19 J	0.2
1,2,4-Trimethylbenzene	ppb(v/v)	NA	0.13 J	0.079 J	0.5	0.21	0.14 J	0.15 J
1,3,5-Trimethylbenzene	ppb(v/v)	NA	<0.2	<0.2	0.25	<0.2	<0.2	<0.2
Benzene	ppb(v/v)	NA	0.49	0.46	0.57	0.42	0.42	0.41
Chloromethane	ppb(v/v)	NA	0.81	0.9	0.85	0.82	1.1	0.91
Dichlorodifluoromethane	ppb(v/v)	NA	0.62	0.57	0.6	0.64	0.68	0.69
Ethylbenzene	ppb(v/v)	NA	0.098 J	0.25	0.85	0.19 J	0.091 J	0.12 J
m-Xylene & p-Xylene	ppb(v/v)	NA	0.34	0.71	3.4	0.5	0.32	0.33
o-Xylene	ppb(v/v)	NA	0.14 J	0.24	1.1	0.19 J	0.13 J	0.14 J
Toluene	ppb(v/v)	NA	2.6	3	5.4	0.84	0.69	0.71
Trichlorofluoromethane	ppb(v/v)	NA	0.32	0.31	0.33	0.31	0.36	0.35
Total VOCs**			**24.2**	**14.0**	**26.0**	**16.1**	**12.9**	**13.5**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-12
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	VMP-02A	VMP-02B	VMP-06A	VMP-06B	VMP-07A	VMP-07B
	Date	RG	4/3/2008	4/3/2008	4/3/2008	4/3/2008	4/3/2008	4/3/2008
Primary VOCs	units							
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	1.8 J	280 J	460	300000	5	120
1,1,2-Trichloroethane	ppb(v/v)	2.03	<2	<570	1.3 J	490 J	0.64 J	1.3 J
1,1-Dichloroethene	ppb(v/v)	29.03	1.8 J	3700	<3.7	<810	0.46 J	5.3
1,2-Dichloroethane	ppb(v/v)	0.64	<2	<570	<3.7	<810	<2	<4.8
Carbon tetrachloride	ppb(v/v)	14.22	<2	<570	19	<810	210	86
Chloroform	ppb(v/v)	32.63	1.2 J	220 J	65	<810	96	48
cis-1,2-Dichloroethene	ppb(v/v)	39.52	96	94000	14	3900	33	130
Methylene chloride	ppb(v/v)	2.85	1.1 J,B	290 J,B	10	410 J,B	5.2 B	2.8 J,B
Tetrachloroethene	ppb(v/v)	0.99	1.3 J	<570	2 J	6400	38	20
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	170 B	9500 B	170	260000 B	100 B	520 B
Vinyl chloride	ppb(v/v)	14.77	<2	21000	<3.7	<810	<2	66
Additional VOCs*								
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	NA	110	<570	<3.7	<810	<2	<4.8
Benzene	ppb(v/v)	NA	<2	<570	<3.7	<810	<2	2 J
Dichlorodifluoromethane	ppb(v/v)	NA	0.95 J	<570	<3.7	<810	0.92 J	<4.8
Toluene	ppb(v/v)	NA	<2	<570	<3.7	<810	<2	<4.8
Trichlorofluoromethane	ppb(v/v)	NA	9.9	<570	0.52 J	<810	0.4 J	<4.8
Total VOCs**			**394**	**128990**	**743**	**571200**	**490**	**1001**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-12
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	VMP-08A	VMP-08B	VMP-02A	VMP-02B	VMP-06A	VMP-06B
	Date	RG	4/3/2008	4/3/2008	4/17/2008	4/17/2008	4/17/2008	4/17/2008
Primary VOCs	units							
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	16	750	1.4	1900	120	160000
1,1,2-Trichloroethane	ppb(v/v)	2.03	0.36 J	40	0.49 J	<1200	0.8	<1200
1,1-Dichloroethene	ppb(v/v)	29.03	0.17 J	13 J	1.7	4100	0.24 J	<1200
1,2-Dichloroethane	ppb(v/v)	0.64	<0.5	<31	<1.3	<1200	<0.67	<1200
Carbon tetrachloride	ppb(v/v)	14.22	120	26 J	0.28 J	<1200	39	<1200
Chloroform	ppb(v/v)	32.63	3.3	89	1.5	380 J	99	<1200
cis-1,2-Dichloroethene	ppb(v/v)	39.52	1.4	670	100	140000	20	2000
Methylene chloride	ppb(v/v)	2.85	0.62 J	15 J,B	0.73 J,B	810 J,B	0.45 J,B	860 J,B
Tetrachloroethene	ppb(v/v)	0.99	16	56	1.4	<1200	3.4	2700
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	10	3400 B	180	39000	170	150000
Vinyl chloride	ppb(v/v)	14.77	<0.5	31	<1.3	18000	<0.67	<1200
Additional VOCs*								
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	NA	<0.5	<31	93	<1200	<0.67	<1200
Benzene	ppb(v/v)	NA	0.29 J	<31	<1.3	<1200	0.25 J	<1200
Dichlorodifluoromethane	ppb(v/v)	NA	0.22 J	<31	0.91 J	<1200	0.6 J	<1200
Toluene	ppb(v/v)	NA	0.63	<31	<1.3	<1200	<0.67	<1200
Trichlorofluoromethane	ppb(v/v)	NA	0.31 J	<31	9	<1200	0.4 J	<1200
Total VOCs**			**170**	**5096**	**390**	**204190**	**454**	**315560**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 4-12
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	Fluvial Soil	VMP-07A	VMP-07B	VMP-08A	VMP-08B
	Date	RG	4/17/2008	4/17/2008	4/17/2008	4/17/2008
Primary VOCs	units					
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.55	12	62	25	730
1,1,2-Trichloroethane	ppb(v/v)	2.03	0.9	1.5 J	0.59	53
1,1-Dichloroethene	ppb(v/v)	29.03	0.33 J	6.4	0.13 J	16 J
1,2-Dichloroethane	ppb(v/v)	0.64	0.38 J	<1.9	0.15 J	<42
Carbon tetrachloride	ppb(v/v)	14.22	170	360	170	27 J
Chloroform	ppb(v/v)	32.63	180	86	6.5	120
cis-1,2-Dichloroethene	ppb(v/v)	39.52	11	540	2.1	820
Methylene chloride	ppb(v/v)	2.85	0.85 J,B	2.1 J,B	0.26 J,B	25 J,B
Tetrachloroethene	ppb(v/v)	0.99	60	45	32	81
trans-1,2-Dichloroethene	ppb(v/v)	133.5	--	--	--	--
Trichloroethene	ppb(v/v)	2.06	64	1000	16	5000
Vinyl chloride	ppb(v/v)	14.77	0.17 J	98	<0.2	44
Additional VOCs*						
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	NA	0.11 J	<1.9	0.1 J	<42
Benzene	ppb(v/v)	NA	1.3	4.7	0.31	<42
Dichlorodifluoromethane	ppb(v/v)	NA	0.83	0.66 J	1	<42
Toluene	ppb(v/v)	NA	0.2 J	<1.9	0.21	<42
Trichlorofluoromethane	ppb(v/v)	NA	0.35 J	0.56 J	0.51	<42
Total VOCs**			**503**	**2208**	**406**	**6923**

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume
NA: Not Applicable
--: Not Analyzed
* Detected above RL
** Sum of all VOCs

TABLE 5-1
HISTORICAL RESULTS FOR PRIMARY CVOCs
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Sample Date	Analyte	SVE-A	SVE-B	SVE-C	SVE-D	SVE-E	SVE-F	SVE-G	SVE-INF
		ppb(v/v)							
7/25/2007	1,1,2,2-Tetrachloroethane	410	230	110000	140000	<3800	150	2600F	290000
Base 1	Chloroform	850	52	4400F	530F	<3800	32	610000	53000
	cis-1,2-Dichloroethene	10000	210	450000	10000	5500F	130	5500	220000
	Tetrachloroethene	590	16	10000	18000	5700	10	13000	19000
	Trichloroethene	38000	960B	1300000B	740000B	320000	670	260000	670000B D
	Total VOCs*	50570	1503	1876600	908000	330300	1003	925500	1261100
8/23/2007	1,1,2,2-Tetrachloroethane	13	14	23000	26000	35	12	13000	8500
Base 4	Chloroform	1600D	4.7	330F	110F	6.8F	4.2	94000	4000
	cis-1,2-Dichloroethene	210	4.1	17000	1600	28	3.8	1400	3500
	Tetrachloroethene	120	0.72	1000	1500	4.8F	0.62	2800	530
	Trichloroethene	700	17	37000	37000	540	15	27000	14000
	Total VOCs*	3400	48	80020	66920	628	41	149440	31560
9/19/2007	1,1,2,2-Tetrachloroethane	4.4F	2	1900	81	740	0.95	4000	70F
Base 5	Chloroform	7200	3.8	76F	6.3	30	4.6	22000	3100
	cis-1,2-Dichloroethene	240	4.7	2700	26	340	5.8	260	3200
	Tetrachloroethene	420	0.21	190	9.7	63	0.2	1300	<170
	Trichloroethene	1600	15	7300	370	5200	19	5900	12000
	Total VOCs*	11130	28	12340	493	6406	33	37860	19090
10/18/2007	1,1,2,2-Tetrachloroethane	14	3.3	3200	3700	3.1	2.8	1100	3100
4Q07	Chloroform	4200D	1.6	110F	35F	1.4	1.5	6200	2000
	cis-1,2-Dichloroethene	120	1.2	3300	210	1.1	1	73	1600
	Tetrachloroethene	260	0.78	340	450	0.73	0.86	390	470
	Trichloroethene	1100D	6	16000	4600	5.5	5.3	1500	8100
	Total VOCs*	6507	18	22840	8960	17	17	10663	15930
1/17/2008	1,1,2,2-Tetrachloroethane	730	10	410	4500	14	9.9	450	1000
1Q08	Chloroform	5300	16	60	38F	17	21	32000	3100
	cis-1,2-Dichloroethene	140	17	2100	140	18	22	210F	3500
	Tetrachloroethene	190	2.5	170	300	3.5	860	1100	330
	Trichloroethene	720	51	13000	3100	68	68	5500	11000
	Total VOCs*	7985	101	15680	8040	127	981	40550	19830
4/24/2008	1,1,2,2-Tetrachloroethane	76	1.5	500	4300	2.7	<0.2	9.5	1800
2Q08	Chloroform	4800	0.48	170	7 F	5.1	0.47	6.3	2200
	cis-1,2-Dichloroethene	21	1.3	2500	110	11	0.64	0.72	3100
	Tetrachloroethene	22	0.062F	180	190	2	<0.2	0.29	170
	Trichloroethene	94	2	13000	2600	120	1.1	3.5	7400
	Total VOCs*	5095.3	9.99	16350	7200	147.16	5.15	25.38	15204
7/16/2008	1,1,2,2-Tetrachloroethane	4.4	9.8	20000	14000	7.2	9.4	420	2700
3Q08	Chloroform	6.7	1.9 F	160	<240	1.6 F	1.6 F	2000	420
	cis-1,2-Dichloroethene	1.2 F	6	4000	880	5.2	5.7	47	1400
	Tetrachloroethene	1.9 F	0.55 F	59	670	0.49 F	0.46 F	27	140
	Trichloroethene	13	24	13000	28000	24	24	600	6800
	Total VOCs*	24.1	39.8	37429	43550	36.4	39.1	3212.3	11557

Notes
B: Method Blank Contamination
D: Result obtained form analysis of dilution
F: Estimate -result >MDL and <RL
N/C: Sample not collected.
<: Result is less than laboratory detection limit.
* Sum of detected analytes above reporting limit.
ppb v/v: parts per billion volume per volume
VOC: volatile organic compound

TABLE 5-2
AVERAGE VOC CONCENTRATIONS USED FOR MASS CALCULATIONS
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	System Influent			System Effluent		
Sample Date	PID Reading (ppm)	Laboratory Total VOC Influent Concentration (ppbv)	VOC Concentration Used for Mass Emission Calculations [1] (ppbv)	PID Reading (ppm)	Laboratory Total VOC Effluent Concentration (ppbv)	VOC Concentration Used for Mass Emission Calculations [1] (ppbv)
7/25/2007	NR	1,261,000	1,261,000	NR	5.82	5.82
7/26/2007	>10,000	NS	903,250 [2]	5.7	NS	2.91 [2]
7/27/2007	1091	NS	545,500	0	NS	0
7/28/2007	538	NS	269,000	0.2	NS	100
7/29/2007	486	NS	243,000	0.1	NS	50
7/30/2007	279	NS	139,500	2.7	NS	1,350
8/3/2007	NR[3]	119,700	119,700	NR[3]	207,000	207,000
8/13/2007	NR	NS	109,745[4]	NR	NS	0[5]
8/16/2007	116	99,790	99,790	0	30.59	30.59
8/23/2007	74.3	31,560	31,560	0.1	42.31	42.31
9/19/2007	21.3	14,800	14,800	27.4	19,090	19,090
10/18/2007	17.5	15,930	15,930	N/C	N/C	15,930[6]
1/17/2008	18.8	NS	19,830	N/C	N/C	19,830[6]
3/20/2008	10.4	NS	19,076[7]	N/C	N/C	19,076[6]
4/17/2005	34.5	NS	34,500[8]	N/C	N/C	34,500[6]
4/24/2008	13.5	15,204	15,204	N/C	N/C	15,204[6]
7/16/2008	17.6	11,557	11,557	N/C	N/C	11,557[6]
8/1/2008	21.8	NS	11557[9]	N/C	N/C	11,557[6]

Notes:

(1) Laboratory sample total VOC concentration used for calculation. If not sample was collected or results are not available, then concentration is half of the PID reading unless otherwise noted. PID readings more accurately reflect declining concentrations trends.

(2) Concentration is average of concentrations from 07/25/07 and 07/27/07.

(3) To minimize system operation time, the SVE system was online for laboratory sampling only.

(4) Concentration is average of concentrations from 08/03/07 and 08/16/07.

(5) Concentration estimated to be 0 ppb following carbon change out.

(6) Treatment system offline. VOC influent concentration used for mass emission calculation.

(7) Start of Rebound Event #1. No sample collected. Concentration is 96.2% of concentration from 1/17/08 and is based on mass rates from four online SVE wells prior to shutdown.

(8) End of Rebound Event #1. No sample collected. Concentration from PID readings.

(9) No sample collected. Used VOC concentration from 07/16/08.

NR: PID reading not collected

NS: Sample not collected.

N/C: Not sample collected. Treatment system offline.

N/A: Not applicable.

TABLE 5-3
MASS EMISSIONS CALCULATIONS
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

SVE System Data				Influent				Effluent		Treatment System	
Start Date	End Date	Hours Operating Between Dates	Average Flow rate (scfm)	Average Influent VOC Concentration (ppbv)	Influent Emission Rate [1] (lb/hr)	Estimated VOC Mass Removal During Period (lbs)	Cumulative Mass Removed From Fluvial Subsurface (lbs)	Average Effluent VOC Concentration (ppbv)	Effluent Emission Rate[2] (lb/hr)	VOC Mass Captured by Treatment System (lbs)	Cumulative VOC Mass Captured by Treatment System (lbs)
7/25/2007	7/25/2007	4	755	1,082,125	16.995	68.0	68.0	4.4	0.000	68.0	68.0
7/26/2007	7/26/2007	4	755	724,375	11.377	45.5	113.5	1.5	0.000	45.5	113.5
7/27/2007	7/27/2007	24	785	407,250	6.650	159.6	273.1	50	0.001	159.6	273.1
7/28/2007	7/28/2007	24	746	256,000	3.973	95.3	368.4	75	0.001	95.3	368.4
7/29/2007	7/29/2007	24	741	191,250	2.948	70.8	439.2	700	0.009	70.5	438.9
7/30/2007	8/2/2007	66	739	129,600	1.992	131.5	570.7	104,175	1.294	46.1	485.0
8/3/2007	8/12/2007	20	740	114,723	1.766	35.3	606.0	207,000	2.351	(11.7)	473.3 [3]
8/13/2007	8/15/2007	39	602	104,768	1.312	51.2	657.2	15.3	0.000	51.2	51.2
8/16/2007	8/22/2007	167	596	65,675	0.814	136.0	793.1	36.5	0.000	135.9	187.1
8/23/2007	9/19/2007	640	758	23,180	0.366	233.9	1,027.1	9,566	0.111	162.7	349.8
9/19/2007	10/18/2007	699	795	15,365	0.254	177.6	1,204.7	17,510	0.290	59.5	409.3[4]
10/18/2007	1/17/2008	2,077	748	17,880	0.278	577.6	1,782.3	N/C	0.278	N/A	N/A
1/17/2008	3/20/2008	1413	738	17,517	0.269	380.0	2,162.3	N/C	0.269	N/A	N/A
3/20/2008	4/17/2008	626	385[5]	19,076	0.153	95.6	2,257.9	N/C	0.153	N/A	N/A
4/17/2008	4/24/2008	145	784	24,852	0.405	58.8	2,316.7	N/C	0.405	N/A	N/A
4/24/2008	7/16/2008	1981	741	13,381	0.206	408.8	2,725.5	N/C	0.206	N/A	N/A
7/16/2008	8/1/2008	362	713	11,557	0.171	62.0	2,787.5	N/C	0.171	N/A	N/A

Notes:

(1) Calculation based on TCE which is the primary constituent.

(2) Calculation based on xylene (primary constituent from sample collected 07/25), cis-1,2-DCE (primary constituent from sample collected on 8/03/07), vinyl chloride (primary constituent from samples collected on 8/16 and 8/23), or TCE (primary constituent from sample collected on 9/19/07 and 10/18/07).

(3) GAC replaced on 13 August 2007.

(4) GAC replaced on 26 December 2007.

(5) Rebound Event #1 occurred between 03/20/08 and 04/17/08. SVE-B, SVE-E, and SVE-F were offline.

N/A: Not applicable. Treatment sytem taken offline on 10/05/07.

N/C: No sample collected. Treatment system offline. Influent emissions rates used for effluent emission rates.

FIGURES

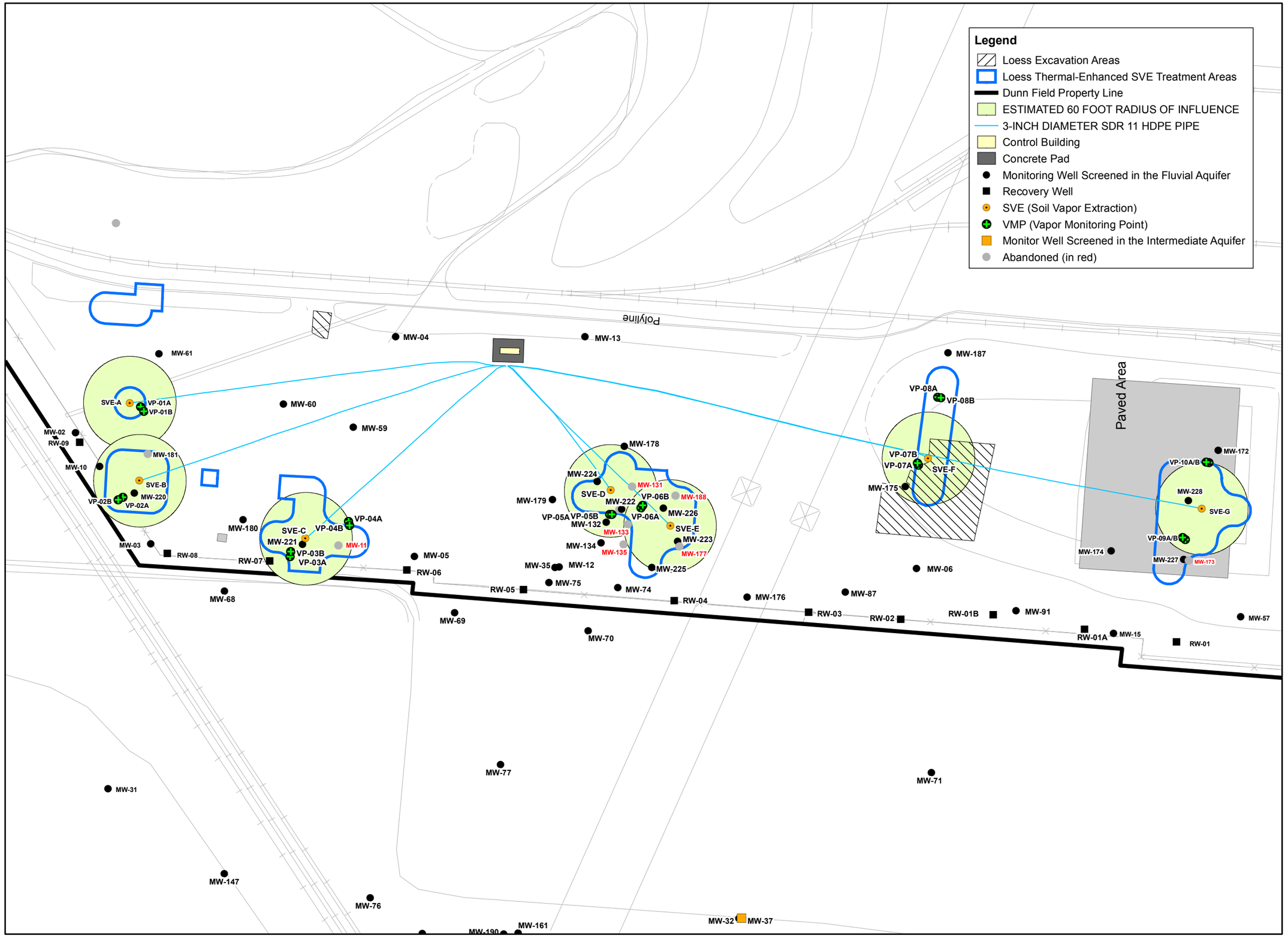

Figure 1-1

FLUVIAL SVE SYSTEM LAYOUT

ANNUAL OPERATIONS REPORT - 2007/8

DUNN FIELD FLUVIAL SVE SYSTEM - YEAR ONE

DEFENSE DEPOT MEMPHIS, TENNESSEE

Projection: NAD 1927 StatePlane Tennessee
Datum : WGS 84
Units: Feet

0 50 100 150 200 Feet

Installation Location
Memphis, Tennessee

Date: June 2009
Edition: Rev 0

G:\3202\019\01-15\SVE Tech Memos\Year 1 Op Summary

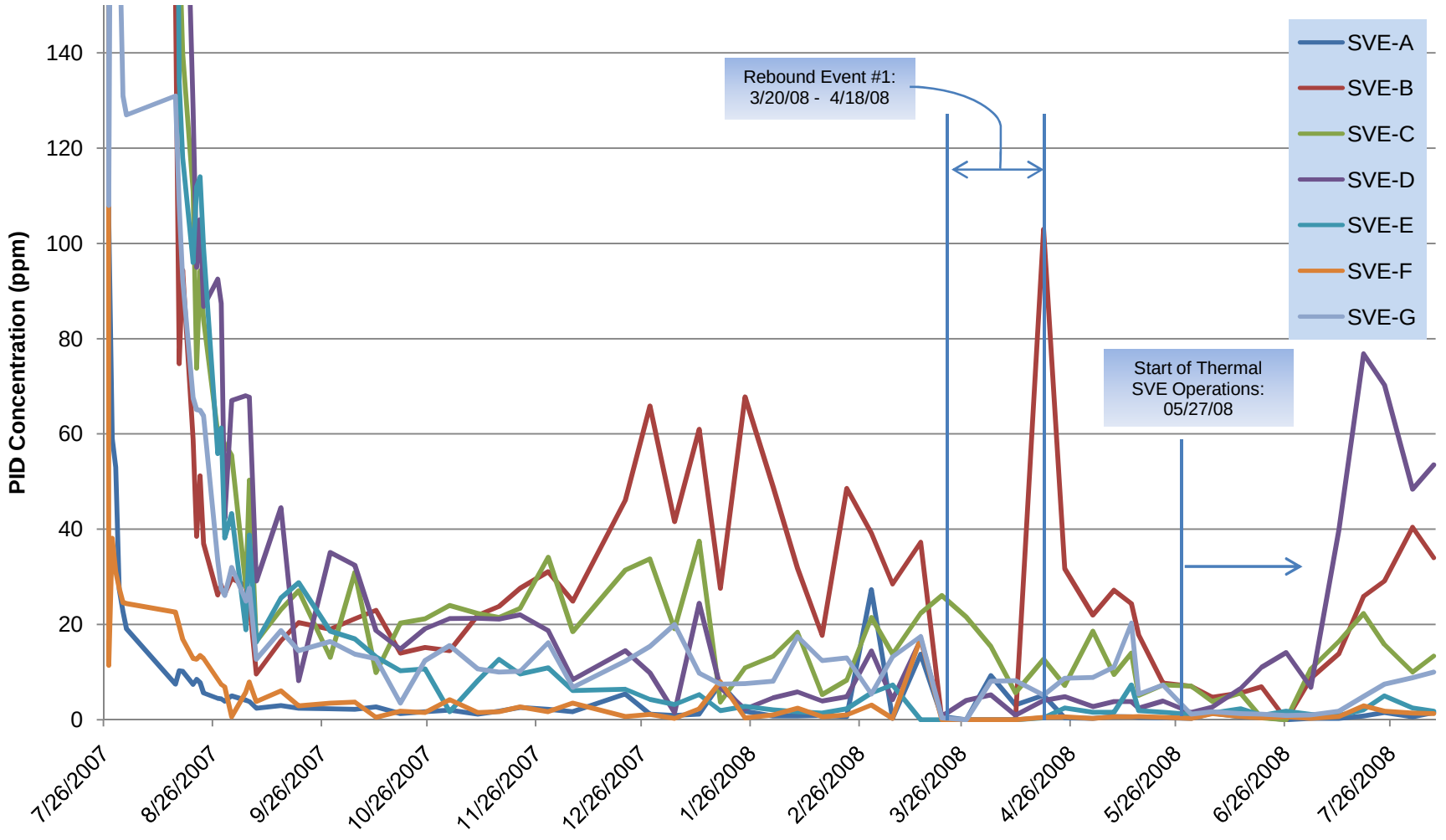

Figure 5-1.
TREND OF PID MEASUREMENTS AT SVE WELLS
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

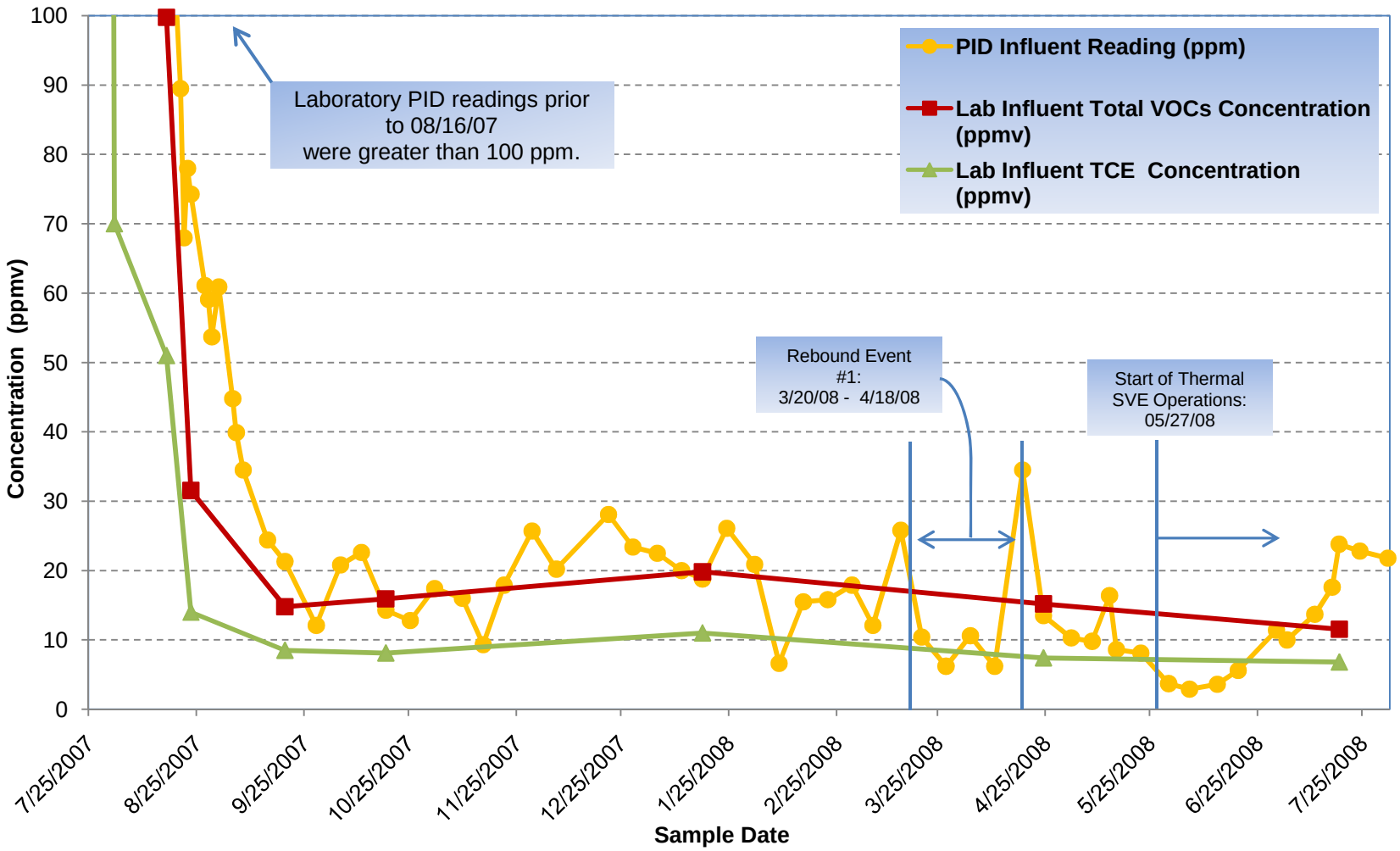

Figure 5-2.
INFLUENT CONCENTRATION TREND - ANALYTICAL RESULTS AND FIELD PID MEASUREMENTS
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

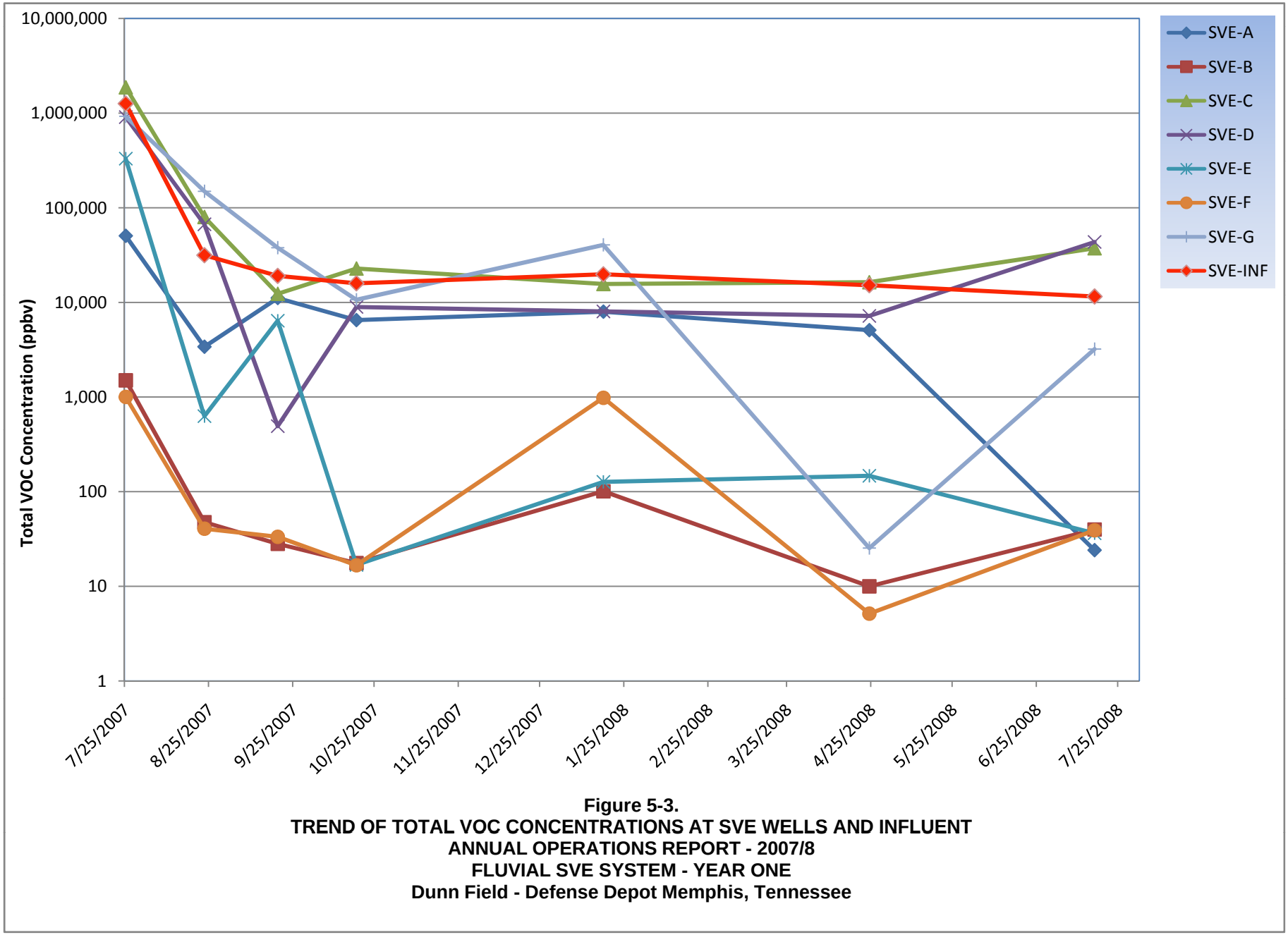

Figure 5-3.
TREND OF TOTAL VOC CONCENTRATIONS AT SVE WELLS AND INFLUENT
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

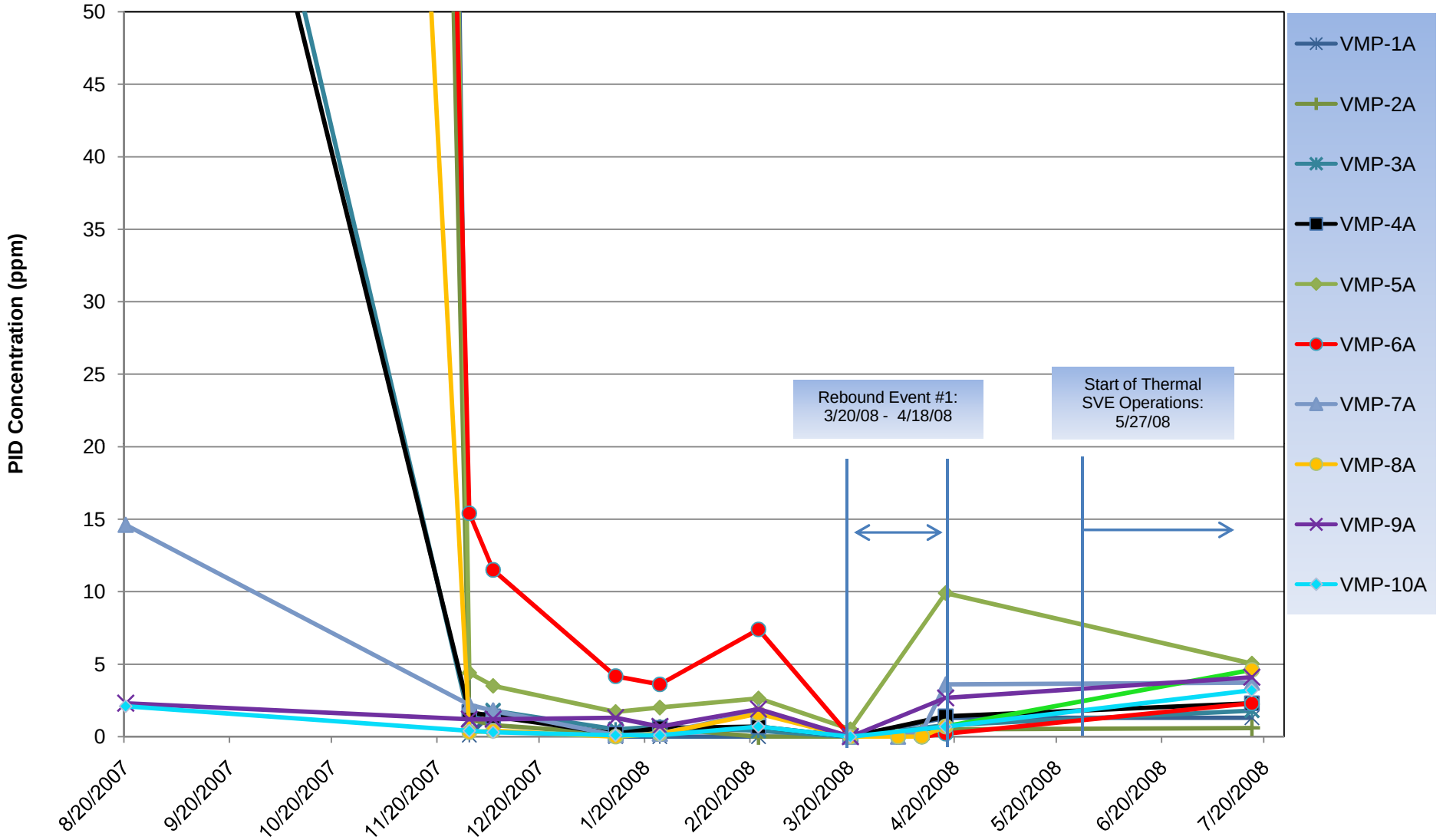

Figure 5-4.
TREND OF PID MEASUREMENTS AT VMP -A WELLS
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

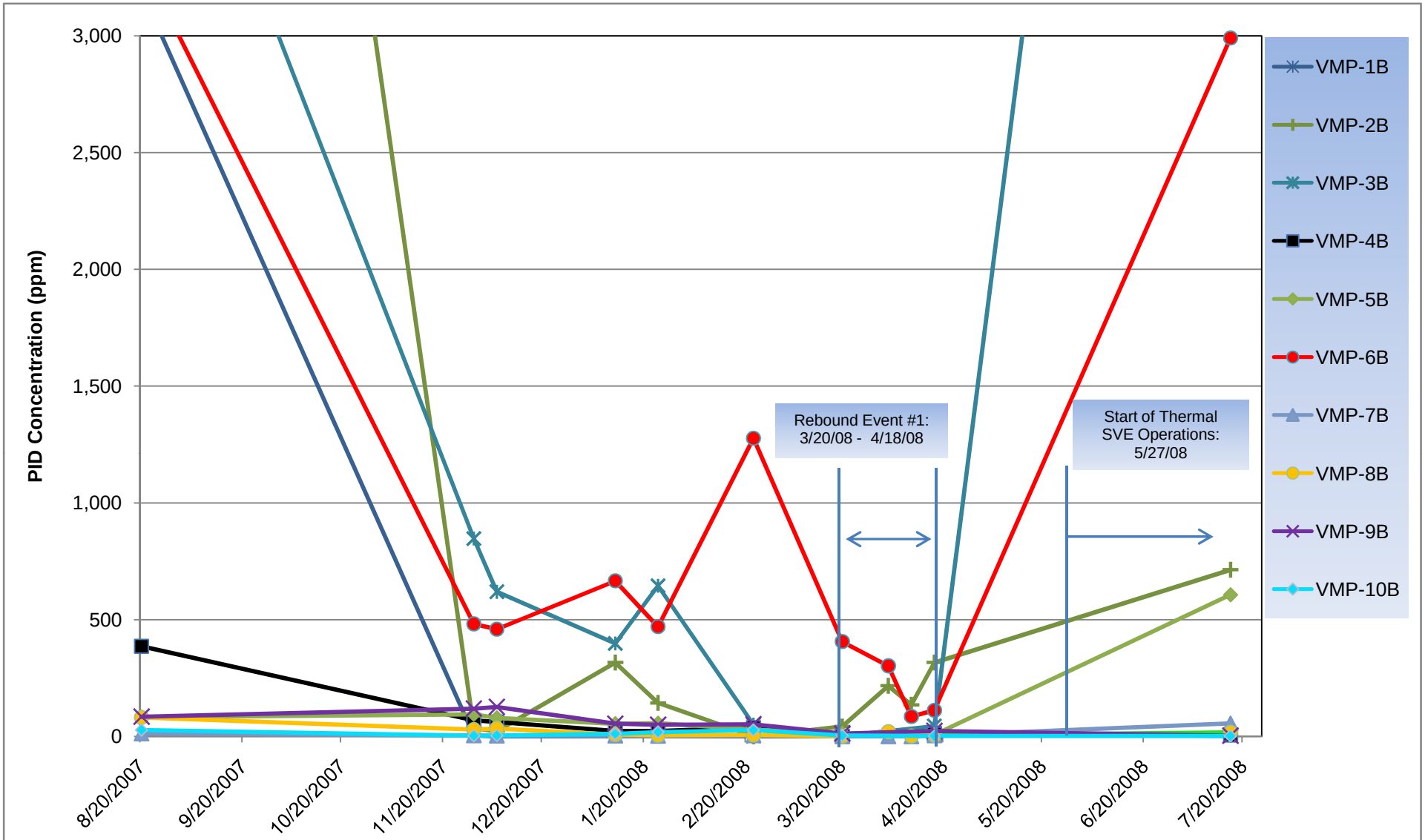

Figure 5-5.
TREND OF PID MEASUREMENTS AT VMP -B WELLS
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM - YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

APPENDIX A

CITY OF MEMPHIS DISCHARGE REQUESTS

City of Memphis
TENNESSEE

DR. WILLIE W. HERENTON - Mayor
KEITH L. McGEE - Chief Administrative Officer
DIVISION OF PUBLIC WORKS
JERRY R. COLLINS JR. - Director
Maynard C. Stiles Wastewater Treatment Plant

Tuesday, February 05, 2008

Mr. Thomas Holmes
Project Manage
e2M Memphis Field office
2241 Truitt Street
Memphis, TN 38114

RE: Request for disposal of groundwater
Industrial Wastewater Discharge Agreement Permit # S-NN3-097
DES-DDC-EE (Memphis) @ 2163 Airways Blvd., Memphis, Tennessee

Dear Mr. Holmes:

We have received and approve your request to discharge of 2,500 gallons of groundwater from monitoring wells into the sanitary sewer system at the above referenced location. The discharge point is the sewer system through the existing discharge line for the ground water recovery system at the Dunn Field. The discharge flow rate should not exceed 30 gallon per minute.

This approval is for this batch of treated groundwater only.

If you should have any questions, please feel free to contact me at (901) 576-4337.

Sincerely,

Akil AL-Chokhachi
Environmental Engineer

4 February 2008

Akil AL-Chokhachi
City of Memphis
2303 North Second Avenue
Memphis, Tennessee 38127-7500

Reference: Wastewater Discharge Request
Industrial Wastewater Discharge Agreement S-NN3-097
Defense Depot Memphis, Tennessee

Dear Mr. AL-Chokhachi:

In accordance with the referenced Agreement, engineering-environmental Management, Inc., on behalf of the Defense Logistics Agency, requests permission to discharge wastewater to the City of Memphis Sewer System. The wastewater was collected by the Air/Water Separator as part of ongoing Soil Vapor Extraction (SVE) operations at Defense Depot Memphis, Tennessee (Dunn Field).

A grab sample of the wastewater was collected on 24 January 2008 and submitted to Test America for analysis of metals and volatile and semi-volatile organic compounds in accordance with the Agreement. An analytical results summary with concentration limits from the Agreement and the complete laboratory report are attached. Zinc; 1,1,2,2-tetrachloroethane, and Bis(2-ethylhexyl)Phthalate exceeded the monthly average maximum but not the one day maximum. If approved, the wastewater volume of approximately 2,300 gallons will be discharged to the sewer system through the existing discharge line for the groundwater recovery system at Dunn Field.

If you need additional information, please contact the undersigned at 404-237-3982 or tholmes@e2m.net. Correspondence can also be sent to e^{2}M's Memphis field office at 2241 Truitt St., Memphis, TN 38114.

Sincerely,
engineering-environmental Management, Inc.

Thomas C. Holmes
Project Manager

cc: Michael A. Dobbs, DES-DDC-EE
Brian Renaghan, AFCEE
Kevin Sedlak, e^{2}M

Sample Identification	FSVE-COND-012408	City of Memphis Industrial Wastewater Allowable Levels	
Date Sample Collected	1/24/08	Monthly Average Maximum	One Day Maximum
Corrosivity	*SU*	*SU*	*SU*
pH	7.1	5.5 to 10	5.5 to 10
TAL Metals[1]	*mg/L*	*mg/L*	*mg/L*
Aluminum (total)	ND	1.000	2.000
Arsenic (total)	ND	0.040	0.100
Barium (total)	0.053	NS	NS
Cadmium (total)	ND	0.010	0.020
Calcium (total)	27	NS	NS
Chromium (total)	ND	0.200	0.400
Cobalt (total)	0.0015 F	NS	NS
Copper (total)	ND	0.200	0.400
Iron (total)	1.5	10.000	20.000
Lead (total)	ND	0.150	0.300
Magnesium (total)	10	NS	NS
Manganese (total)	0.68	NS	NS
Mercury (total)	ND	0.001	0.002
Nickel (total)	ND	0.100	0.300
Potassium (total)	2.1	NS	NS
Selenium (total)	0.0077 F	NS	NS
Sodium (total)	11	NS	NS
Zinc (total)	**0.680**	0.300	1.000
TCL Volatile Organics[2]	*ug/L*	*ug/L*	*ug/L*
Carbon Tetrachloride	0.55 F	20	40
Chloroform	28	100	200
1,1-dichloroethene	0.17 F	50	100
Cis-1,2-dichloroethene	27	80	100
Trans-1,2-dichloroethene	6.3	50	100
Methylene Chloride	0.31 F	10	20
1,1,2,2-tetrachloroethane	**590**	500	1000
Tetrachloroethene	0.92 F	60	120
Toluene	ND	20	40
1,1,1-trichloroethane	ND	10	20
1,1,2-trichloroethane	1.6	50	100
Trichloroethene	60	400	800
Vinyl chloride	0.23 F	400	800
TCL Semi-Volatile Organics[3]	*ug/L*	*ug/L*	*ug/L*
Bis (2-ethylhexyl) Phthalate	**11**	10	20
Di-n-butyl Phthalate	ND	30	60
Naphthalene	ND	10	20
Phenol	ND	10	20

Notes

(1) Metals analyses performed by EPA Method 6010B except for Mercury (EPA Method 7470A) and Arsenic, Antimony, Thallium and Selenium (EPA Method 6020)
(2) TCL Volatile Organic analyses performed by EPA Method 8260B
(3) TCL Semi-Volatile Organic Analyses performed by EPA Method 8270C
NS = No standard listed in the Industrial Wastewater Discharge Permit
ND = Analyte not detected; Reporting Limit shown
F = Found, the analyte was positively identified with concentration above MDL but below the reporting limit
B = Analyte found in a blank sample

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Memphis Depot - Fluvial SVE

Project#: 3202-031-01-04

PO#:

Lot #: D8A250161

Dr. Lance Hines

e2M
184 Creekside Park
STE 100
Spring Branch, TX 78070

TestAmerica, Inc.

Andrew Wemmer
Project Manager

February 1, 2008

TestAmerica, Inc

Volatile GC/MS

CLP-Like Forms

Lot ID: D8A250161

Client: e2M

Method: SW846 8260B

Associated Samples: 001-002

Batch: 8032179

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V51A5
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	8260B	**Date Leached:**	
Unit:	ug/L	**Date/Time Extracted:**	02/01/08 06:58
QC Batch ID:	8032179	**Date/Time Analyzed:**	02/01/08 09:48
Sample Aliquot:	20 mL	**Instrument ID:**	H
Dilution Factor:	1	**Extraction Method:**	5030B/8260B

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
630-20-6	1,1,1,2-Tetrachloroethane	Jason Reinhardt	JR	0.14	0.14	0.50	U
71-55-6	1,1,1-Trichloroethane	Jason Reinhardt	JR	0.053	0.053	1.0	U
79-00-5	1,1,2-Trichloroethane	Jason Reinhardt	JR	**1.6**	0.13	1.0	
75-34-3	1,1-Dichloroethane	Jason Reinhardt	JR	0.057	0.057	1.0	U
75-35-4	1,1-Dichloroethene	Jason Reinhardt	JR	**0.17**	0.074	1.0	F
563-58-6	1,1-Dichloropropene	Jason Reinhardt	JR	0.080	0.080	1.0	U
87-61-6	1,2,3-Trichlorobenzene	Jason Reinhardt	JR	0.16	0.16	1.0	U
96-18-4	1,2,3-Trichloropropane	Jason Reinhardt	JR	0.27	0.27	1.0	U
120-82-1	1,2,4-Trichlorobenzene	Jason Reinhardt	JR	0.14	0.14	1.0	U
95-63-6	1,2,4-Trimethylbenzene	Jason Reinhardt	JR	0.081	0.081	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	Jason Reinhardt	JR	0.71	0.71	2.0	U
106-93-4	1,2-Dibromoethane (EDB)	Jason Reinhardt	JR	0.18	0.18	1.0	U
95-50-1	1,2-Dichlorobenzene	Jason Reinhardt	JR	0.11	0.11	1.0	U
107-06-2	1,2-Dichloroethane	Jason Reinhardt	JR	0.068	0.068	0.50	U
78-87-5	1,2-Dichloropropane	Jason Reinhardt	JR	0.078	0.078	1.0	U
108-67-8	1,3,5-Trimethylbenzene	Jason Reinhardt	JR	0.083	0.083	1.0	U
541-73-1	1,3-Dichlorobenzene	Jason Reinhardt	JR	0.14	0.14	1.0	U
142-28-9	1,3-Dichloropropane	Jason Reinhardt	JR	0.077	0.077	0.40	U
106-46-7	1,4-Dichlorobenzene	Jason Reinhardt	JR	0.12	0.12	0.50	U
544-10-5	1-Chlorohexane	Jason Reinhardt	JR	0.11	0.11	1.0	U
594-20-7	2,2-Dichloropropane	Jason Reinhardt	JR	0.18	0.18	1.0	U
78-93-3	2-Butanone (MEK)	Jason Reinhardt	JR	1.2	1.2	10	U
95-49-8	2-Chlorotoluene	Jason Reinhardt	JR	0.088	0.088	1.0	U
106-43-4	4-Chlorotoluene	Jason Reinhardt	JR	0.083	0.083	1.0	U
67-64-1	Acetone	Jason Reinhardt	JR	1.6	1.6	10	U
71-43-2	Benzene	Jason Reinhardt	JR	0.13	0.13	0.40	U
108-86-1	Bromobenzene	Jason Reinhardt	JR	0.066	0.066	1.0	U
74-97-5	Bromochloromethane	Jason Reinhardt	JR	0.21	0.21	1.0	U
75-27-4	Bromodichloromethane	Jason Reinhardt	JR	0.21	0.21	0.50	U

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V51A5
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	8260B	**Date Leached:**	
Unit:	ug/L	**Date/Time Extracted:**	02/01/08 06:58
QC Batch ID:	8032179	**Date/Time Analyzed:**	02/01/08 09:48
Sample Aliquot:	20 mL	**Instrument ID:**	H
Dilution Factor:	1	**Extraction Method:**	5030B/8260B

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
75-25-2	Bromoform	Jason Reinhardt	JR	0.22	0.22	1.0	U
74-83-9	Bromomethane	Jason Reinhardt	JR	0.19	0.19	3.0	U
56-23-5	Carbon tetrachloride	Jason Reinhardt	JR	**0.55**	0.11	1.0	F
108-90-7	Chlorobenzene	Jason Reinhardt	JR	0.076	0.076	0.50	U
75-00-3	Chloroethane	Jason Reinhardt	JR	0.13	0.13	1.0	U
67-66-3	Chloroform	Jason Reinhardt	JR	**28**	0.052	0.30	
74-87-3	Chloromethane	Jason Reinhardt	JR	0.083	0.083	1.0	U
156-59-2	cis-1,2-Dichloroethene	Jason Reinhardt	JR	**27**	0.098	1.0	
10061-01-5	cis-1,3-Dichloropropene	Jason Reinhardt	JR	0.078	0.078	0.50	U
124-48-1	Dibromochloromethane	Jason Reinhardt	JR	0.046	0.046	0.50	U
74-95-3	Dibromomethane	Jason Reinhardt	JR	0.17	0.17	1.0	U
75-71-8	Dichlorodifluoromethane	Jason Reinhardt	JR	0.049	0.049	1.0	U
100-41-4	Ethylbenzene	Jason Reinhardt	JR	0.099	0.099	1.0	U
87-68-3	Hexachlorobutadiene	Jason Reinhardt	JR	0.16	0.16	0.60	U
98-82-8	Isopropylbenzene	Jason Reinhardt	JR	0.12	0.12	1.0	U
108-10-1	Methyl isobutyl ketone (MIBK)	Jason Reinhardt	JR	1.1	1.1	10	U
1634-04-4	Methyl tert-butyl ether	Jason Reinhardt	JR	0.18	0.18	5.0	U
75-09-2	Methylene chloride	Jason Reinhardt	JR	**0.31**	0.21	2.0	F
136777-61-2	m-Xylene & p-Xylene	Jason Reinhardt	JR	0.10	0.10	2.0	U
91-20-3	Naphthalene	Jason Reinhardt	JR	0.25	0.25	1.0	U
104-51-8	n-Butylbenzene	Jason Reinhardt	JR	0.12	0.12	1.0	U
103-65-1	n-Propylbenzene	Jason Reinhardt	JR	0.13	0.13	1.0	U
95-47-6	o-Xylene	Jason Reinhardt	JR	0.087	0.087	1.0	U
99-87-6	p-Isopropyltoluene	Jason Reinhardt	JR	0.10	0.10	1.0	U
135-98-8	sec-Butylbenzene	Jason Reinhardt	JR	0.18	0.18	1.0	U
100-42-5	Styrene	Jason Reinhardt	JR	0.066	0.066	1.0	U
98-06-6	tert-Butylbenzene	Jason Reinhardt	JR	0.099	0.099	1.0	U
127-18-4	Tetrachloroethene	Jason Reinhardt	JR	**0.92**	0.14	1.0	F
108-88-3	Toluene	Jason Reinhardt	JR	0.068	0.068	1.0	U

Form 1 Analysis Data Sheet Equivalent

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V51A5
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	8260B	**Date Leached:**	
Unit:	ug/L	**Date/Time Extracted:**	02/01/08 06:58
QC Batch ID:	8032179	**Date/Time Analyzed:**	02/01/08 09:48
Sample Aliquot:	20 mL	**Instrument ID:**	H
Dilution Factor:	1	**Extraction Method:**	5030B/8260B

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
156-60-5	trans-1,2-Dichloroethene	Jason Reinhardt	JR	**6.3**	0.056	1.0	
10061-02-6	trans-1,3-Dichloropropene	Jason Reinhardt	JR	0.065	0.065	1.0	U
79-01-6	Trichloroethene	Jason Reinhardt	JR	**60**	0.10	1.0	
75-69-4	Trichlorofluoromethane	Jason Reinhardt	JR	0.067	0.067	1.0	U
75-01-4	Vinyl chloride	Jason Reinhardt	JR	**0.23**	0.078	1.0	F

CAS No.	Surrogate	% Rec	Lower Limit	Upper Limit	Q
17060-07-0	1,2-Dichloroethane-d4	83	72	119	
2037-26-5	Toluene-d8	87	81	120	
1868-53-7	Dibromofluoromethane	98	85	115	
460-00-4	4-Bromofluorobenzene	94	76	119	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V52A5
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	8260B	**Date Leached:**	
Unit:	ug/L	**Date/Time Extracted:**	02/01/08 06:58
QC Batch ID:	8032179	**Date/Time Analyzed:**	02/01/08 10:30
Sample Aliquot:	1 mL	**Instrument ID:**	H
Dilution Factor:	20	**Extraction Method:**	5030B/8260B

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
79-34-5	1,1,2,2-Tetrachloroethane	Jason Reinhardt	JR	**590**	3.0	10	

CAS No.	Surrogate	% Rec	Lower Limit	Upper Limit	Q
17060-07-0	1,2-Dichloroethane-d4	79	72	119	
2037-26-5	Toluene-d8	91	81	120	
1868-53-7	Dibromofluoromethane	95	85	115	
460-00-4	4-Bromofluorobenzene	95	76	119	

TestAmerica, Inc

Semivolatile GC/MS

CLP-Like Forms

Lot ID: D8A250161

Client: e2M

Method: SW846 8270C

Associated Samples: 001

Batch: 8025170

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V51A6
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	8270C	**Date Leached:**	
Unit:	ug/L	**Date/Time Extracted:**	01/25/08 12:00
QC Batch ID:	8025170	**Date/Time Analyzed:**	01/29/08 13:27
Sample Aliquot:	899 mL	**Instrument ID:**	K
Dilution Factor:	1.11	**Extraction Method:**	3520C

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
120-82-1	1,2,4-Trichlorobenzene	Daniel Kiekel	DK	0.50	0.50	11	U
95-50-1	1,2-Dichlorobenzene	Daniel Kiekel	DK	0.31	0.31	11	U
541-73-1	1,3-Dichlorobenzene	Daniel Kiekel	DK	0.32	0.32	11	U
106-46-7	1,4-Dichlorobenzene	Daniel Kiekel	DK	0.33	0.33	11	U
95-95-4	2,4,5-Trichlorophenol	Daniel Kiekel	DK	0.43	0.43	56	U
88-06-2	2,4,6-Trichlorophenol	Daniel Kiekel	DK	0.41	0.41	11	U
120-83-2	2,4-Dichlorophenol	Daniel Kiekel	DK	1.4	1.4	11	U
105-67-9	2,4-Dimethylphenol	Daniel Kiekel	DK	0.63	0.63	11	U
51-28-5	2,4-Dinitrophenol	Daniel Kiekel	DK	22	22	56	U
121-14-2	2,4-Dinitrotoluene	Daniel Kiekel	DK	0.28	0.28	11	U
606-20-2	2,6-Dinitrotoluene	Daniel Kiekel	DK	0.26	0.26	11	U
91-58-7	2-Chloronaphthalene	Daniel Kiekel	DK	0.34	0.34	11	U
95-57-8	2-Chlorophenol	Daniel Kiekel	DK	0.42	0.42	11	U
91-57-6	2-Methylnaphthalene	Daniel Kiekel	DK	0.32	0.32	11	U
95-48-7	2-Methylphenol	Daniel Kiekel	DK	1.1	1.1	11	U
88-74-4	2-Nitroaniline	Daniel Kiekel	DK	0.36	0.36	56	U
88-75-5	2-Nitrophenol	Daniel Kiekel	DK	2.2	2.2	11	U
91-94-1	3,3'-Dichlorobenzidine	Daniel Kiekel	DK	2.2	2.2	22	U
99-09-2	3-Nitroaniline	Daniel Kiekel	DK	2.2	2.2	56	U
534-52-1	4,6-Dinitro-2-methylphenol	Daniel Kiekel	DK	0.39	0.39	56	U
101-55-3	4-Bromophenyl phenyl ether	Daniel Kiekel	DK	0.48	0.48	11	U
59-50-7	4-Chloro-3-methylphenol	Daniel Kiekel	DK	2.2	2.2	22	U
106-47-8	4-Chloroaniline	Daniel Kiekel	DK	2.2	2.2	22	U
7005-72-3	4-Chlorophenyl phenyl ether	Daniel Kiekel	DK	0.72	0.72	11	U
106-44-5	4-Methylphenol	Daniel Kiekel	DK	0.82	0.82	56	U
100-01-6	4-Nitroaniline	Daniel Kiekel	DK	1.1	1.1	56	U
100-02-7	4-Nitrophenol	Daniel Kiekel	DK	1.9	1.9	56	U
83-32-9	Acenaphthene	Daniel Kiekel	DK	0.31	0.31	11	U
208-96-8	Acenaphthylene	Daniel Kiekel	DK	0.54	0.54	11	U

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V51A6
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	8270C	**Date Leached:**	
Unit:	ug/L	**Date/Time Extracted:**	01/25/08 12:00
QC Batch ID:	8025170	**Date/Time Analyzed:**	01/29/08 13:27
Sample Aliquot:	899 mL	**Instrument ID:**	K
Dilution Factor:	1.11	**Extraction Method:**	3520C

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
120-12-7	Anthracene	Daniel Kiekel	DK	0.47	0.47	11	U
56-55-3	Benzo(a)anthracene	Daniel Kiekel	DK	0.39	0.39	11	U
50-32-8	Benzo(a)pyrene	Daniel Kiekel	DK	0.82	0.82	11	U
205-99-2	Benzo(b)fluoranthene	Daniel Kiekel	DK	0.43	0.43	11	U
191-24-2	Benzo(ghi)perylene	Daniel Kiekel	DK	0.56	0.56	11	U
207-08-9	Benzo(k)fluoranthene	Daniel Kiekel	DK	0.51	0.51	11	U
65-85-0	Benzoic acid	Daniel Kiekel	DK	22	22	110	U
100-51-6	Benzyl alcohol	Daniel Kiekel	DK	0.50	0.50	22	U
111-91-1	bis(2-Chloroethoxy)methane	Daniel Kiekel	DK	0.36	0.36	11	U
111-44-4	bis(2-Chloroethyl) ether	Daniel Kiekel	DK	0.46	0.46	11	U
108-60-1	bis(2-Chloroisopropyl) ether	Daniel Kiekel	DK	0.48	0.48	11	U
117-81-7	bis(2-Ethylhexyl) phthalate	Daniel Kiekel	DK	**11**	0.62	11	
85-68-7	Butyl benzyl phthalate	Daniel Kiekel	DK	1.1	1.1	11	U
218-01-9	Chrysene	Daniel Kiekel	DK	0.60	0.60	11	U
53-70-3	Dibenz(a,h)anthracene	Daniel Kiekel	DK	0.57	0.57	11	U
132-64-9	Dibenzofuran	Daniel Kiekel	DK	0.32	0.32	11	U
84-66-2	Diethyl phthalate	Daniel Kiekel	DK	0.42	0.42	11	U
131-11-3	Dimethyl phthalate	Daniel Kiekel	DK	1.1	1.1	11	U
84-74-2	Di-n-butyl phthalate	Daniel Kiekel	DK	1.3	1.3	11	U
117-84-0	Di-n-octyl phthalate	Daniel Kiekel	DK	0.39	0.39	11	U
206-44-0	Fluoranthene	Daniel Kiekel	DK	0.22	0.22	11	U
86-73-7	Fluorene	Daniel Kiekel	DK	0.34	0.34	11	U
118-74-1	Hexachlorobenzene	Daniel Kiekel	DK	0.73	0.73	11	U
87-68-3	Hexachlorobutadiene	Daniel Kiekel	DK	0.57	0.57	11	U
67-72-1	Hexachloroethane	Daniel Kiekel	DK	0.51	0.51	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	Daniel Kiekel	DK	0.72	0.72	11	U
78-59-1	Isophorone	Daniel Kiekel	DK	0.23	0.23	11	U
91-20-3	Naphthalene	Daniel Kiekel	DK	0.32	0.32	11	U
98-95-3	Nitrobenzene	Daniel Kiekel	DK	0.90	0.90	11	U

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THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V51A6
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	8270C	**Date Leached:**	
Unit:	ug/L	**Date/Time Extracted:**	01/25/08 12:00
QC Batch ID:	8025170	**Date/Time Analyzed:**	01/29/08 13:27
Sample Aliquot:	899 mL	**Instrument ID:**	K
Dilution Factor:	1.11	**Extraction Method:**	3520C

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
621-64-7	N-Nitrosodi-n-propylamine	Daniel Kiekel	DK	0.39	0.39	11	U
86-30-6	N-Nitrosodiphenylamine	Daniel Kiekel	DK	0.49	0.49	11	U
87-86-5	Pentachlorophenol	Daniel Kiekel	DK	22	22	56	U
85-01-8	Phenanthrene	Daniel Kiekel	DK	0.29	0.29	11	U
108-95-2	Phenol	Daniel Kiekel	DK	0.34	0.34	11	U
129-00-0	Pyrene	Daniel Kiekel	DK	0.41	0.41	11	U

CAS No.	Surrogate	% Rec	Lower Limit	Upper Limit	Q
321-60-8	2-Fluorobiphenyl	76	48	120	
367-12-4	2-Fluorophenol	79	20	120	
118-79-6	2,4,6-Tribromophenol	83	42	124	
4165-60-0	Nitrobenzene-d5	81	41	120	
4165-62-2	Phenol-d5	84	20	120	
1718-51-0	Terphenyl-d14	95	51	135	

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Total Metals

CLP-Like Forms

Lot ID: D8A250161

Client: e2M

Method: SW846 6010B / 7470A

Associated Samples: 001

Batch: 8025436, 8028174

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Total Metals Analysis
COVER PAGE - INORGANIC ANALYSIS DATA PACKAGE

Contract: e2M Engineering - Environmental Mngmt Inc SDG No.: D8A250161

Lab Code: TALDEN Case No.: SAS No.:

SOW No.:

Sample ID.	Lab Sample No.
FSVE-COND-012408	D8A250161-001

Were ICP interelement corrections applied?	Yes/No	YES
Were ICP background corrections applied?	Yes/No	YES
If yes-were raw data generated before application of background corrections?	Yes/No	NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Janice Collins Name: Janice Collins

Date: 2/1/08 Title: Metals Analyst

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Total Metals Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V5
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	6010B	**Date Leached:**	
Unit:	mg/L	**Date/Time Extracted:**	01/28/08 08:30
QC Batch ID:	8025436	**Date/Time Analyzed:**	01/29/08 13:16
Sample Aliquot:	50 mL	**Instrument ID:**	025
Dilution Factor:	1	**Extraction Method:**	3010A

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
7429-90-5	Aluminum	Lynn-Anne Trudell	LT	0.018	0.018	0.20	U
7440-38-2	Arsenic	Lynn-Anne Trudell	LT	0.0044	0.0044	0.030	U
7440-39-3	Barium	Lynn-Anne Trudell	LT	**0.053**	0.0010	0.050	
7440-41-7	Beryllium	Lynn-Anne Trudell	LT	0.00047	0.00047	0.0010	U
7440-43-9	Cadmium	Lynn-Anne Trudell	LT	0.00045	0.00045	0.0050	U
7440-70-2	Calcium	Lynn-Anne Trudell	LT	**27**	0.034	1.1	
7440-47-3	Chromium	Lynn-Anne Trudell	LT	0.0026	0.0026	0.010	U
7440-48-4	Cobalt	Lynn-Anne Trudell	LT	**0.0015**	0.0012	0.060	F
7440-50-8	Copper	Lynn-Anne Trudell	LT	0.0045	0.0045	0.010	U
7439-92-1	Lead	Lynn-Anne Trudell	LT	0.0026	0.0026	0.025	U
7439-95-4	Magnesium	Lynn-Anne Trudell	LT	**10**	0.043	1.0	
7439-96-5	Manganese	Lynn-Anne Trudell	LT	**0.68**	0.0018	0.010	
7439-98-7	Molybdenum	Lynn-Anne Trudell	LT	0.0053	0.0053	0.015	U
7440-02-0	Nickel	Lynn-Anne Trudell	LT	0.0078	0.0078	0.020	U
7440-09-7	Potassium	Lynn-Anne Trudell	LT	**2.1**	0.24	1.0	
7440-22-4	Silver	Lynn-Anne Trudell	LT	0.0028	0.0028	0.010	U
7440-23-5	Sodium	Lynn-Anne Trudell	LT	**11**	0.092	1.0	
7440-28-0	Thallium	Lynn-Anne Trudell	LT	0.0049	0.0049	0.080	U
7440-62-2	Vanadium	Lynn-Anne Trudell	LT	0.0025	0.0025	0.010	U
7440-66-6	Zinc	Lynn-Anne Trudell	LT	**0.68**	0.0045	0.020	

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THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Total Metals Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V5
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	6010B	**Date Leached:**	
Unit:	mg/L	**Date/Time Extracted:**	01/28/08 08:30
QC Batch ID:	8025436	**Date/Time Analyzed:**	01/30/08 07:26
Sample Aliquot:	50 mL	**Instrument ID:**	025
Dilution Factor:	1	**Extraction Method:**	3010A

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
7439-89-6	Iron	Lynn-Anne Trudell	LT	**1.5**	0.022	0.20	
7782-49-2	Selenium	Lynn-Anne Trudell	LT	**0.0077**	0.0049	0.030	F

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THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Total Metals Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V5
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	6010B	**Date Leached:**	
Unit:	mg/L	**Date/Time Extracted:**	01/28/08 08:30
QC Batch ID:	8025436	**Date/Time Analyzed:**	01/31/08 10:47
Sample Aliquot:	50 mL	**Instrument ID:**	025
Dilution Factor:	1	**Extraction Method:**	3010A

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
7440-36-0	Antimony	Lynn-Anne Trudell	LT	0.0031	0.0031	0.050	U

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THE LEADER IN ENVIRONMENTAL TESTING

e2M Engineering-Environmental Mngmt Inc

Memphis Depot

Total Metals Analysis Data Sheet

Lab Name:	TESTAMERICA DENVER	**Client Sample ID:**	FSVE-COND-012408
Lot/SDG Number:	D8A250161	**Lab Sample ID:**	D8A250161-001
Matrix:	WATER	**Lab WorkOrder:**	KF4V5
% Moisture:	N/A	**Date/Time Collected:**	01/24/08 09:30
Basis:	Wet	**Date/Time Received:**	01/25/08 08:45
Analysis Method:	7470A	**Date Leached:**	
Unit:	mg/L	**Date/Time Extracted:**	01/28/08 17:50
QC Batch ID:	8028174	**Date/Time Analyzed:**	01/29/08 15:15
Sample Aliquot:	10 mL	**Instrument ID:**	019
Dilution Factor:	1	**Extraction Method:**	7470A

CAS No.	Analyte	Analyst Name	Initials	Conc.	MDL	RL	Q
7439-97-6	Mercury	Christopher Grisdale	CG	0.000027	0.000027	0.0010	U

TestAmerica, Inc.

General Chemistry

CLP-Like Forms

Lot ID: D8A250161

Client: e2M

Method: 9040B

Associated Samples: 001

Batch: 8026128

e2M Engineering-Environmental Mngmt Inc

Client Sample ID: FSVE-COND-012408

General Chemistry

Lot-Sample #...: D8A250161-001 **Work Order #...:** KF4V5 **Matrix.....:** WATER
Date Sampled...: 01/24/08 09:30 **Date Received..:** 01/25/08

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
pH	**7.1**	**0.10**	**No Units**	**SW846 9040B**	**01/25/08**	**8026128**

Dilution Factor: 1 Analysis Time..: 16:10 MDL.....:

APPENDIX B

RESULTS OF LABORATORY ANALYSIS

Table B-1 Analytical Results – SVE Wells and System (Baseline Event #1)
Table B-2 Analytical Results – Vapor Monitoring Points (Baseline Event #1)
Table B-3 Analytical Results – SVE System (Baseline Events #2 and #3)
Table B-4 Analytical Results – SVE Wells and System (Baseline Event #4)
Table B-5 Analytical Results – SVE Wells and System (Baseline Event #5)
Table B-6 Analytical Results – SVE Wells and System (4Q07 Event)
Table B-7 Analytical Results – SVE Wells and System (1Q08 Event)
Table B-8 Analytical Results – SVE Wells and System (2Q08 Event)
Table B-9 Analytical Results – SVE Wells and System (3Q08 Event)
Table B-10 Analytical Results – Vapor Monitoring Points (3Q08 Event)
Table B-11 Analytical Results –SVE Wells (Rebound Events 1A and 1B)
Table B-12 Analytical Results – Vapor Monitoring Points (Rebound Events 1A and 1B)

TABLE B-1
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Units	SVE-A 7/25/2007	SVE-A DUP 7/25/2007	SVE-B 7/25/2007	SVE-C 7/25/2007	SVE-D 7/25/2007
1,1,1-Trichloroethane	ppb v/v	<330	<560	<4	<6100	<2500
1,1,2,2-Tetrachloroethane	ppb v/v	410	<560	230	110000	140000
trifluoroethane	ppb v/v	<330	<560	<4	<6100	<2500
1,1,2-Trichloroethane	ppb v/v	<330	<560	2.8 J	6600	<2500
1,1-Dichloroethane	ppb v/v	<330	<560	<4	<6100	<2500
1,1-Dichloroethene	ppb v/v	220 J	270 J	<4	<6100	<2500
1,2,4-Trichlorobenzene	ppb v/v	<1700	<2800	<20	<30000	<12000
1,2,4-Trimethylbenzene	ppb v/v	<330	<560	<4	<6100	<2500
tetrafluoroethane	ppb v/v	<330	<560	<4	<6100	<2500
1,2-Dichlorobenzene	ppb v/v	<330	<560	<4	<6100	<2500
1,2-Dichloroethane	ppb v/v	270 J	2000	<4	2400 J	<2500
1,2-Dichloropropane	ppb v/v	<330	<560	<4	<6100	<2500
1,3,5-Trimethylbenzene	ppb v/v	<330	<560	<4	<6100	<2500
1,3-Dichlorobenzene	ppb v/v	<330	<560	<4	<6100	<2500
1,4-Dichlorobenzene	ppb v/v	<330	<560	<4	<6100	<2500
Benzene	ppb v/v	<330	<560	<4	<6100	<2500
Benzyl chloride	ppb v/v	<660	<1100	<8	<12000	<5000
Bromomethane	ppb v/v	<330	<560	<4	<6100	<2500
Carbon tetrachloride	ppb v/v	720	580	5.9	<6100	<2500
Chlorobenzene	ppb v/v	<330	<560	<4	<6100	<2500
Chloroethane	ppb v/v	<330	<560	<4	<6100	<2500
Chloroform	ppb v/v	850	1100	52	4400 J	530 J
Chloromethane	ppb v/v	<830	<1400	<10	<15000	<6200
cis-1,2-Dichloroethene	ppb v/v	10000	14000	210	450000	10000
cis-1,3-Dichloropropene	ppb v/v	<330	<560	<4	<6100	<2500
Dibromomethane	ppb v/v	<660	<1100	<8	<12000	<5000
Dichlorodifluoromethane	ppb v/v	<330	<560	<4 J	<6100 J	<2500 J
Ethylbenzene	ppb v/v	<330	<560	<4	<6100	<2500
Hexachlorobutadiene	ppb v/v	<1700	<2800	<20	<30000	<12000
Methylene chloride	ppb v/v	130 J,B	400 J,B	29 B	2200 J,B	990 J,B
m-Xylene & p-Xylene	ppb v/v	<330	<560	<4	<6100	<2500
o-Xylene	ppb v/v	<330	<560	<4	<6100	<2500
Styrene	ppb v/v	<330	<560	<4	<6100	<2500
Tetrachloroethene	ppb v/v	590	720	16	10000	18000
Toluene	ppb v/v	<330	460 J	<4	<6100	<2500
trans-1,3-Dichloropropene	ppb v/v	<830	<1400	<10	<15000	<6200
Trichloroethene	ppb v/v	38000	50000	960 B	1300000 B	740000 B
Trichlorofluoromethane	ppb v/v	<330	76 J,B	0.74 J	<6100	<2500
Vinyl chloride		<330	<560	<4	<6100	<2500

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-1
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Units	SVE-E 7/25/2007	SVE-F 7/25/2007	SVE-F 7/25/2007	SVE-G 7/25/2007
1,1,1-Trichloroethane	ppb v/v	<3800	<8	<7.9	<2800
1,1,2,2-Tetrachloroethane	ppb v/v	<3800	100	150	2600 J
trifluoroethane	ppb v/v	<3800	<8	<7.9	<2800
1,1,2-Trichloroethane	ppb v/v	<3800	<8	<7.9	<2800
1,1-Dichloroethane	ppb v/v	<3800	<8	<7.9	<2800
1,1-Dichloroethene	ppb v/v	<3800	<8	<7.9	<2800
1,2,4-Trichlorobenzene	ppb v/v	<19000	<40	<39	<14000
1,2,4-Trimethylbenzene	ppb v/v	<3800	<8	<7.9	<2800
tetrafluoroethane	ppb v/v	<3800	<8	<7.9	<2800
1,2-Dichlorobenzene	ppb v/v	<3800	<8	<7.9	<2800
1,2-Dichloroethane	ppb v/v	4600	6.7 J	11	<2800
1,2-Dichloropropane	ppb v/v	<3800	<8	<7.9	<2800
1,3,5-Trimethylbenzene	ppb v/v	<3800	<8	<7.9	<2800
1,3-Dichlorobenzene	ppb v/v	<3800	<8	<7.9	<2800
1,4-Dichlorobenzene	ppb v/v	<3800	<8	<7.9	<2800
Benzene	ppb v/v	<3800	<8	<7.9	<2800
Benzyl chloride	ppb v/v	<7600	<16	<16	<5500
Bromomethane	ppb v/v	<3800	<8	<7.9	<2800
Carbon tetrachloride	ppb v/v	<3800	3.5 J	3.2 J	37000
Chlorobenzene	ppb v/v	<3800	<8	<7.9	<2800
Chloroethane	ppb v/v	<3800	<8	<7.9	<2800
Chloroform	ppb v/v	<3800	26	32	610000
Chloromethane	ppb v/v	<9500	<20	<20	<6900
cis-1,2-Dichloroethene	ppb v/v	5500 J	110	130	5500
cis-1,3-Dichloropropene	ppb v/v	<3800	<8	<7.9	<2800
Dibromomethane	ppb v/v	<7600	<16	<16	<5500
Dichlorodifluoromethane	ppb v/v	<3800	<8	<7.9	<2800
Ethylbenzene	ppb v/v	<3800	<8	<7.9	<2800
Hexachlorobutadiene	ppb v/v	<19000	<40	<39	<14000
Methylene chloride	ppb v/v	1200 J,B	2.6 J,B	2.1 J,B	1000 J,B
m-Xylene & p-Xylene	ppb v/v	<3800	<8	<7.9	<2800
o-Xylene	ppb v/v	<3800	<8	<7.9	<2800
Styrene	ppb v/v	<3800	<8	<7.9	<2800
Tetrachloroethene	ppb v/v	5700	7.9 J	10	13000
Toluene	ppb v/v	<3800	<8	<7.9	<2800
trans-1,3-Dichloropropene	ppb v/v	<9500	<20	<20	<6900
Trichloroethene	ppb v/v	320000	520	670	260000
Trichlorofluoromethane	ppb v/v	<3800	<8	<7.9	<2800
Vinyl chloride		<3800	<8	<7.9	<2800

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-1
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Units	SVE-INF 7/25/2007	DUP 7/25/2007	SVE-MID 7/25/2007	SVE-EFF 7/25/2007
1,1,1-Trichloroethane	ppb v/v	<2300	<9200	<0.2	<0.2
1,1,2,2-Tetrachloroethane	ppb v/v	290000	490000	1.8	0.58
trifluoroethane	ppb v/v	<2300	<9200	<0.2	<0.2
1,1,2-Trichloroethane	ppb v/v	4200	5300 J	<0.2	<0.2
1,1-Dichloroethane	ppb v/v	<2300	<9200	<0.2	<0.2
1,1-Dichloroethene	ppb v/v	<2300	<9200	<0.2	<0.2
1,2,4-Trichlorobenzene	ppb v/v	<11000	<46000	<1	<1
1,2,4-Trimethylbenzene	ppb v/v	<2300	<9200	0.14 J	0.098 J
tetrafluoroethane	ppb v/v	<2300	<9200	<0.2	<0.2
1,2-Dichlorobenzene	ppb v/v	<2300	<9200	<0.2	<0.2
1,2-Dichloroethane	ppb v/v	670 J	<9200	<0.2	<0.2
1,2-Dichloropropane	ppb v/v	<2300	<9200	<0.2	<0.2
1,3,5-Trimethylbenzene	ppb v/v	<2300	<9200	<0.2	<0.2
1,3-Dichlorobenzene	ppb v/v	<2300	<9200	<0.2	<0.2
1,4-Dichlorobenzene	ppb v/v	<2300	<9200	0.087 J	0.24
Benzene	ppb v/v	<2300	<9200	2.3	0.66
Benzyl chloride	ppb v/v	<4600	<18000	<0.4	<0.4
Bromomethane	ppb v/v	<2300	<9200	<0.2	<0.2
Carbon tetrachloride	ppb v/v	4900	9400	<0.2	<0.2
Chlorobenzene	ppb v/v	<2300	<9200	0.2	<0.2
Chloroethane	ppb v/v	<2300	<9200	<0.2	<0.2
Chloroform	ppb v/v	53000	89000	<0.2	<0.2
Chloromethane	ppb v/v	<5700	<23000	0.58	<0.5
cis-1,2-Dichloroethene	ppb v/v	220000	370000	<0.3	<0.3
cis-1,3-Dichloropropene	ppb v/v	<2300	<9200	<0.2	<0.2
Dibromomethane	ppb v/v	<4600	<18000	<0.4	<0.4
Dichlorodifluoromethane	ppb v/v	<2300	<9200	<0.2	<0.2
Ethylbenzene	ppb v/v	<2300	<9200	1	0.36
Hexachlorobutadiene	ppb v/v	<11000	<46000	<1	<1
Methylene chloride	ppb v/v	790 J,B	3100 J,B	0.74 B	0.15 J,B
m-Xylene & p-Xylene	ppb v/v	<2300	<9200	5.4	1.7
o-Xylene	ppb v/v	<2300	<9200	3.2	0.88
Styrene	ppb v/v	<2300	<9200	<0.2	0.079 J
Tetrachloroethene	ppb v/v	19000	26000	0.07 J	<0.2
Toluene	ppb v/v	<2300	<9200	0.54	0.79
trans-1,3-Dichloropropene	ppb v/v	<5700	<23000	<0.5	<0.5
Trichloroethene	ppb v/v	670000 B	1500000	0.88	0.61 B
Trichlorofluoromethane	ppb v/v	<2300	<9200	0.13 J,B	<0.2
Vinyl chloride		1300 J	<9200	<0.2	<0.2

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-2
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-01A	VMP-01B	VMP-02A	VMP-02B	VMP-03A
	Date	7/25/2007	7/25/2007	7/25/2007	7/25/2007	7/24/2007
Analyte	Units					
1,1,1-Trichloroethane	ppb v/v	<410	<390	<110	<1200	<580
1,1,2,2-Tetrachloroethane	ppb v/v	<410	<390	54 J	<1200	<580
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<410	<390	<110	<1200	<580
1,1,2-Trichloroethane	ppb v/v	<410	<390	<110	<1200	<580
1,1-Dichloroethane	ppb v/v	<410	<390	<110	<1200	<580
1,1-Dichloroethene	ppb v/v	240 J	180 J	43 J	1800	<580
1,2,4-Trichlorobenzene	ppb v/v	<2100	<2000	<560	<6000	<2900
1,2,4-Trimethylbenzene	ppb v/v	170 J	<390	<110	<1200	<580
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<410	<390	<110	<1200	<580
1,2-Dichlorobenzene	ppb v/v	<410	<390	<110	<1200	<580
1,2-Dichloroethane	ppb v/v	<410	<390	<110	<1200	<580
1,2-Dichloropropane	ppb v/v	<410	<390	<110	<1200	<580
1,3,5-Trimethylbenzene	ppb v/v	<410	<390	<110	<1200	<580
1,3-Dichlorobenzene	ppb v/v	<410	<390	<110	<1200	<580
1,4-Dichlorobenzene	ppb v/v	<410	<390	<110	<1200	<580
Benzene	ppb v/v	<410	<390	<110	<1200	<580
Benzyl chloride	ppb v/v	<830	<790	<230	<2400	<1200
Bromomethane	ppb v/v	<410	<390	<110	<1200	<580
Carbon tetrachloride	ppb v/v	450	220 J	<110	<1200	<580
Chlorobenzene	ppb v/v	<410	<390	<110	<1200	<580
Chloroethane	ppb v/v	<410	<390	<110	<1200	<580
Chloroform	ppb v/v	1100	180 J	<110	830 J	220 J
Chloromethane	ppb v/v	<1000	<980	<280	<3000	460 J
cis-1,2-Dichloroethene	ppb v/v	21000	7000	4800	240000	25000
cis-1,3-Dichloropropene	ppb v/v	<410	<390	<110	<1200	<580
Dibromomethane	ppb v/v	<830	<790	<230	<2400	<1200
Dichlorodifluoromethane	ppb v/v	<410	<390	<110	<1200	<580
Ethylbenzene	ppb v/v	<410	<390	<110	<1200	<580
Hexachlorobutadiene	ppb v/v	<2100	<2000	<560	<6000	<2900
Methylene chloride	ppb v/v	190 J,B	190 J,B	59 J,B	580 J,B	340 J,B
m-Xylene & p-Xylene	ppb v/v	<410	<390	<110	<1200	<580
o-Xylene	ppb v/v	<410	<390	<110	<1200	<580
Styrene	ppb v/v	<410	<390	<110	<1200	<580
Tetrachloroethene	ppb v/v	860	550	48 J	1600	760
Toluene	ppb v/v	<410	<390	88 J	<1200	<580
trans-1,3-Dichloropropene	ppb v/v	<1000	<980	<280	<3000	<1400
Trichloroethene	ppb v/v	67000	40000	13000	460000 B	81000
Trichlorofluoromethane	ppb v/v	<410	<390	<110	<1200	<580
Vinyl chloride	ppb v/v	<410	<390	98 J	4500	<580

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-2
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-03B	VMP-04A	VMP-04B	VMP-05A	VMP-05B
	Date	7/24/2007	7/24/2007	7/24/2007	7/24/2007	7/24/2007
Analyte	Units					
1,1,1-Trichloroethane	ppb v/v	<11000	<400	<1200	<6200	<420
1,1,2,2-Tetrachloroethane	ppb v/v	<11000	190 J	<1200	110000	<420
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<11000	<400	<1200	<6200	<420
1,1,2-Trichloroethane	ppb v/v	<11000	<400	<1200	<6200	<420
1,1-Dichloroethane	ppb v/v	<11000	<400	<1200	<6200	<420
1,1-Dichloroethene	ppb v/v	<11000	<400	<1200	<6200	<420
1,2,4-Trichlorobenzene	ppb v/v	<56000	<2000	<6200	<31000	<2100
1,2,4-Trimethylbenzene	ppb v/v	<11000	<400	<1200	<6200	<420
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<11000	<400	<1200	<6200	<420
1,2-Dichlorobenzene	ppb v/v	<11000	<400	<1200	<6200	<420
1,2-Dichloroethane	ppb v/v	<11000	<400	<1200	<6200	<420
1,2-Dichloropropane	ppb v/v	<11000	<400	<1200	<6200	<420
1,3,5-Trimethylbenzene	ppb v/v	<11000	<400	<1200	<6200	<420
1,3-Dichlorobenzene	ppb v/v	<11000	<400	<1200	<6200	<420
1,4-Dichlorobenzene	ppb v/v	<11000	<400	<1200	<6200	<420
Benzene	ppb v/v	<11000	<400	<1200	<6200	<420
Benzyl chloride	ppb v/v	<22000	<800	<2500	<12000	<850
Bromomethane	ppb v/v	<11000	<400	<1200	<6200	<420
Carbon tetrachloride	ppb v/v	<11000	<400	<1200	<6200	<420
Chlorobenzene	ppb v/v	<11000	<400	<1200	<6200	<420
Chloroethane	ppb v/v	<11000	<400	<1200	<6200	<420
Chloroform	ppb v/v	3300 J	230 J	850 J	<6200	<420
Chloromethane	ppb v/v	<28000	<1000	<3100	<16000	<1100
cis-1,2-Dichloroethene	ppb v/v	570000	23000	100000	40000	1000
cis-1,3-Dichloropropene	ppb v/v	<11000	<400	<1200	<6200	<420
Dibromomethane	ppb v/v	<22000	<800	<2500	<12000	<850
Dichlorodifluoromethane	ppb v/v	<11000	<400	<1200	<6200	<420
Ethylbenzene	ppb v/v	<11000	<400	<1200	<6200	<420
Hexachlorobutadiene	ppb v/v	<56000	<2000	<6200	<31000	<2100
Methylene chloride	ppb v/v	4200 J,B	190 J,B	470 J,B	2000 J,B	160 J,B
m-Xylene & p-Xylene	ppb v/v	<11000	<400	<1200	<6200	<420
o-Xylene	ppb v/v	<11000	<400	<1200	<6200	<420
Styrene	ppb v/v	<11000	<400	<1200	<6200	<420
Tetrachloroethene	ppb v/v	27000	750	3000	39000	1300
Toluene	ppb v/v	<11000	<400	<1200	<6200	<420
trans-1,3-Dichloropropene	ppb v/v	<28000	<1000	<3100	<16000	<1100
Trichloroethene	ppb v/v	2700000	64000	330000	2500000 B	66000
Trichlorofluoromethane	ppb v/v	<11000	<400	<1200	<6200	<420
Vinyl chloride	ppb v/v	<11000	<400	<1200	<6200	<420

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-2
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-06A	VMP-06B	VMP-07A	VMP-07B	VMP-08A
	Date	7/24/2007	7/24/2007	7/24/2007	7/24/2007	7/25/2007
Analyte	Units					
1,1,1-Trichloroethane	ppb v/v	<3000	<3000	<40	<31	<31
1,1,2,2-Tetrachloroethane	ppb v/v	4000	310000	78	14 J	57
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<3000	<3000	<40	<31	<31
1,1,2-Trichloroethane	ppb v/v	<3000	<3000	49	14 J	21 J
1,1-Dichloroethane	ppb v/v	<3000	<3000	<40	<31	<31
1,1-Dichloroethene	ppb v/v	<3000	<3000	<40	14 J	<31
1,2,4-Trichlorobenzene	ppb v/v	<15000	<15000	<200	<160	<150
1,2,4-Trimethylbenzene	ppb v/v	<3000	<3000	<40	<31	<31
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<3000	<3000	<40	<31	<31
1,2-Dichlorobenzene	ppb v/v	<3000	<3000	<40	<31	<31
1,2-Dichloroethane	ppb v/v	<3000	<3000	<40	<31	<31
1,2-Dichloropropane	ppb v/v	<3000	<3000	<40	<31	<31
1,3,5-Trimethylbenzene	ppb v/v	<3000	<3000	<40	<31	<31
1,3-Dichlorobenzene	ppb v/v	<3000	<3000	<40	<31	<31
1,4-Dichlorobenzene	ppb v/v	<3000	<3000	<40	<31	<31
Benzene	ppb v/v	<3000	<3000	15 J	19 J	15 J
Benzyl chloride	ppb v/v	<6000	<5900	<80	<62	<62
Bromomethane	ppb v/v	<3000	<3000	<40	<31	<31
Carbon tetrachloride	ppb v/v	<3000	<3000	410	<31	<31
Chlorobenzene	ppb v/v	<3000	<3000	<40	<31	<31
Chloroethane	ppb v/v	<3000	<3000	<40	<31	<31
Chloroform	ppb v/v	<3000	<3000	290	410	160
Chloromethane	ppb v/v	<7500	<7400	<100	<78	<77
cis-1,2-Dichloroethene	ppb v/v	11000	16000	5900	4700	910
cis-1,3-Dichloropropene	ppb v/v	<3000	<3000	<40	<31	<31
Dibromomethane	ppb v/v	<6000	<5900	<80	<62	<62
Dichlorodifluoromethane	ppb v/v	<3000	<3000	<40	<31	<31
Ethylbenzene	ppb v/v	<3000	<3000	<40	<31	<31
Hexachlorobutadiene	ppb v/v	<15000	<15000	<200	<160	<150
Methylene chloride	ppb v/v	990 J,B	1100 J,B	29 J,B	19 J,B	26 J,B
m-Xylene & p-Xylene	ppb v/v	<3000	<3000	<40	<31	<31
o-Xylene	ppb v/v	<3000	<3000	<40	<31	<31
Styrene	ppb v/v	<3000	<3000	<40	<31	<31
Tetrachloroethene	ppb v/v	12000	21000	37 J	82	32
Toluene	ppb v/v	<3000	<3000	16 J	<31	<31
trans-1,3-Dichloropropene	ppb v/v	<7500	<7400	<100	<78	<77
Trichloroethene	ppb v/v	880000	1300000 B	6300 B	6300 B	4800 B
Trichlorofluoromethane	ppb v/v	<3000	<3000	<40	<31	5.6 J,B
Vinyl chloride	ppb v/v	<3000	<3000	100	64	36

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-2
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (BASELINE EVENT #1)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-08B	VMP-09A	VMP-09B	VMP-10A	VMP-10B
	Date	7/23/2007	7/23/2007	7/23/2007	7/23/2007	7/23/2007
Analyte	Units					
1,1,1-Trichloroethane	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,1,2,2-Tetrachloroethane	ppb v/v	3000	<2.9	950 J	4.9 J	83 J
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,1,2-Trichloroethane	ppb v/v	400	<2.9	<1200	<7.2	<220
1,1-Dichloroethane	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,1-Dichloroethene	ppb v/v	<320	1.9 J	<1200	<7.2	<220
1,2,4-Trichlorobenzene	ppb v/v	<1600	<14	<5800	<36	<1100
1,2,4-Trimethylbenzene	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,2-Dichlorobenzene	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,2-Dichloroethane	ppb v/v	240 J	<2.9	<1200	28 J	<220
1,2-Dichloropropane	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,3,5-Trimethylbenzene	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,3-Dichlorobenzene	ppb v/v	<320	<2.9	<1200	<7.2	<220
1,4-Dichlorobenzene	ppb v/v	<320	<2.9	<1200	<7.2	<220
Benzene	ppb v/v	<320	<2.9	<1200	<7.2	<220
Benzyl chloride	ppb v/v	<640	<5.7	<2300	<14	<440
Bromomethane	ppb v/v	<320	<2.9	<1200	<7.2	<220
Carbon tetrachloride	ppb v/v	930	360	60000	420	15000
Chlorobenzene	ppb v/v	<320	<2.9	<1200	<7.2	<220
Chloroethane	ppb v/v	<320	<2.9	<1200	<7.2	<220
Chloroform	ppb v/v	1400	2700	190000	920	56000
Chloromethane	ppb v/v	<800	<7.1	<2900	<18	<550
cis-1,2-Dichloroethene	ppb v/v	7400	46	2800	10 J	420
cis-1,3-Dichloropropene	ppb v/v	<320	<2.9	<1200	<7.2	<220
Dibromomethane	ppb v/v	<640	<5.7	<2300	<14	<440
Dichlorodifluoromethane	ppb v/v	<320	<2.9	<1200 J	<7.2	<220 J
Ethylbenzene	ppb v/v	<320	<2.9	<1200	<7.2	<220
Hexachlorobutadiene	ppb v/v	<1600	<14	<5800	<36	<1100
Methylene chloride	ppb v/v	240 J,B	1.4 J,B	2100 J,B	3.7 J,B	210 J,B
m-Xylene & p-Xylene	ppb v/v	<320	<2.9	<1200	<7.2	<220
o-Xylene	ppb v/v	<320	<2.9	<1200	<7.2	<220
Styrene	ppb v/v	<320	<2.9	<1200	<7.2	<220
Tetrachloroethene	ppb v/v	810	4.7	16000	53	3000
Toluene	ppb v/v	<320	<2.9	<1200	<7.2	<220
trans-1,3-Dichloropropene	ppb v/v	<800	<7.1	<2900	<18	<550
Trichloroethene	ppb v/v	40000	590 B	97000 B	710	27000 B
Trichlorofluoromethane	ppb v/v	<320	<2.9	<1200	<7.2	<220
Vinyl chloride	ppb v/v	330	1.1 J	<1200	<7.2	<220

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-3
ANALYTICAL RESULTS – SVE SYSTEM (BASELINE EVENTS #2 AND #3)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Units	SVE-INF 8/3/2007	SVE-INF DUP 8/3/2007	SVE-INF 8/16/2007	SVE-MID 8/3/2007	SVE-MID 8/16/2007
1,1,1-Trichloroethane	ppb v/v	<580	<580	<490	<1800	<0.2
1,1,2,2-Tetrachloroethane	ppb v/v	14000	13000	25000	<1800	0.21
trifluoroethane	ppb v/v	<580	<580	<490	<1800	<0.2
1,1,2-Trichloroethane	ppb v/v	390 J	380 J	370 J	<1800	<0.2
1,1-Dichloroethane	ppb v/v	<580	<580	<490	<1800	<0.2
1,1-Dichloroethene	ppb v/v	<580	<580	<490	<1800	<0.2
1,2,4-Trichlorobenzene	ppb v/v	<2900	<2900	<2500	<8800	<1
1,2,4-Trimethylbenzene	ppb v/v	<580	<580	<490	<1800	0.092 J
tetrafluoroethane	ppb v/v	<580	<580	<490	<1800	<0.2
1,2-Dichlorobenzene	ppb v/v	<580	<580	<490	<1800	<0.2
1,2-Dichloroethane	ppb v/v	180 J,B	170 J,B	<490	630 J,B	<0.2
1,2-Dichloropropane	ppb v/v	<580	<580	<490	<1800	<0.2
1,3,5-Trimethylbenzene	ppb v/v	<580	<580	<490	<1800	<0.2
1,3-Dichlorobenzene	ppb v/v	<580	<580	<490	<1800	<0.2
1,4-Dichlorobenzene	ppb v/v	<580	<580	<490	<1800	<0.2
Benzene	ppb v/v	<580	<580	<490	<1800	0.42
Benzyl chloride	ppb v/v	<1200	<1200	<990	<3500	<0.4
Bromomethane	ppb v/v	<580	<580	<490	<1800	<0.2
Carbon tetrachloride	ppb v/v	<580	<580	590	2300	<0.2
Chlorobenzene	ppb v/v	<580	<580	<490	<1800	0.13 J
Chloroethane	ppb v/v	<580	<580	<490	<1800	0.12 J
Chloroform	ppb v/v	14000	13000	9800	20000	3.7
Chloromethane	ppb v/v	<1400	<1400	<1200	<4400	<0.5
cis-1,2-Dichloroethene	ppb v/v	20000	19000	12000	26000	10
cis-1,3-Dichloropropene	ppb v/v	<580	<580	<490	<1800	<0.2
Dibromomethane	ppb v/v	<1200	<1200	<990	<3500	<0.4
Dichlorodifluoromethane	ppb v/v	<580	<580	<490	<1800	0.53
Ethylbenzene	ppb v/v	<580	<580	<490	<1800	1.2
Hexachlorobutadiene	ppb v/v	<2900	<2900	<2500	<8800	<1
Methylene chloride	ppb v/v	310 J,B	290 J,B	170 J,B	560 J,B	5.4 B
m-Xylene & p-Xylene	ppb v/v	<580	<580	<490	<1800	7.1
o-Xylene	ppb v/v	<580	<580	<490	<1800	6.4
Styrene	ppb v/v	<580	<580	<490	<1800	<0.2
Tetrachloroethene	ppb v/v	1700	1600	1400	<1800	0.22
Toluene	ppb v/v	220 J	190 J	<490	<1800	0.15 J
trans-1,3-Dichloropropene	ppb v/v	<1400	<1400	<1200	<4400	<0.5
Trichloroethene	ppb v/v	70000 B	65000	51000	180000 B	28
Trichlorofluoromethane	ppb v/v	<580	<580	<490	<1800	<0.2
Vinyl chloride	ppb v/v	<580	<580	320 J,B	<1800	33 B

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-3
ANALYTICAL RESULTS – SVE SYSTEM (BASELINE EVENTS #2 AND #3)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Units	SVE-MID DUP 8/16/2007	SVE-EFF 8/3/2007	SVE-EFF 8/16/2007
1,1,1-Trichloroethane	ppb v/v	<0.2	<1100	<0.2
1,1,2,2-Tetrachloroethane	ppb v/v	0.18 J	<1100	<0.2
trifluoroethane	ppb v/v	<0.2	<1100	0.049 J
1,1,2-Trichloroethane	ppb v/v	<0.2	<1100	<0.2
1,1-Dichloroethane	ppb v/v	<0.2	<1100	<0.2
1,1-Dichloroethene	ppb v/v	<0.2	<1100	<0.2
1,2,4-Trichlorobenzene	ppb v/v	<1	<5400	0.32 J
1,2,4-Trimethylbenzene	ppb v/v	0.091 J	<1100	0.066 J
tetrafluoroethane	ppb v/v	<0.2	<1100	<0.2
1,2-Dichlorobenzene	ppb v/v	<0.2	<1100	<0.2
1,2-Dichloroethane	ppb v/v	<0.2	360 J,B	<0.2
1,2-Dichloropropane	ppb v/v	<0.2	<1100	<0.2
1,3,5-Trimethylbenzene	ppb v/v	<0.2	<1100	<0.2
1,3-Dichlorobenzene	ppb v/v	<0.2	<1100	<0.2
1,4-Dichlorobenzene	ppb v/v	<0.2	<1100	<0.2
Benzene	ppb v/v	0.45	<1100	<0.2
Benzyl chloride	ppb v/v	<0.4	<2200	<0.4
Bromomethane	ppb v/v	<0.2	<1100	<0.2
Carbon tetrachloride	ppb v/v	<0.2	<1100	<0.2
Chlorobenzene	ppb v/v	0.13 J	<1100	<0.2
Chloroethane	ppb v/v	0.15 J	<1100	<0.2
Chloroform	ppb v/v	3.6	37000	0.87
Chloromethane	ppb v/v	<0.5	<2700	<0.5
cis-1,2-Dichloroethene	ppb v/v	9.7	170000	2.8
cis-1,3-Dichloropropene	ppb v/v	<0.2	<1100	<0.2
Dibromomethane	ppb v/v	<0.4	<2200	<0.4
Dichlorodifluoromethane	ppb v/v	0.6	<1100	0.5
Ethylbenzene	ppb v/v	1.1	<1100	0.14 J
Hexachlorobutadiene	ppb v/v	<1	<5400	0.15 J
Methylene chloride	ppb v/v	5.4	610 J,B	0.071 J,B
m-Xylene & p-Xylene	ppb v/v	6.3	<1100	0.79
o-Xylene	ppb v/v	5.7	<1100	0.66
Styrene	ppb v/v	<0.2	<1100	<0.2
Tetrachloroethene	ppb v/v	0.17 J	<1100	0.71
Toluene	ppb v/v	0.12 J	<1100	0.088 J
trans-1,3-Dichloropropene	ppb v/v	<0.5	<2700	<0.5
Trichloroethene	ppb v/v	27	650 J,B	0.26
Trichlorofluoromethane	ppb v/v	<0.2	<1100	<0.2
Vinyl chloride	ppb v/v	42	<1100	24 B

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limi
Units: ppb v/v: parts per billion volume per vol

TABLE B-4
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM(BASELINE EVENT #4)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	SVE-A	SVE-B	SVE-C	SVE-C DUP
	Date	8/23/2007	8/23/2007	8/23/2007	8/23/2007
Analyte	Units				
1,1,1-Trichloroethane	ppb(v/v)	<4.9	<0.2	<430	<310
1,1,2,2-Tetrachloroethane	ppb(v/v)	13	14	23000	22000
trifluoroethane	ppb(v/v)	<4.9	0.079 J	<430	<310
1,1,2-Trichloroethane	ppb(v/v)	<4.9	0.15 J	620	660
1,1-Dichloroethane	ppb(v/v)	<4.9	<0.2	<430	<310
1,1-Dichloroethene	ppb(v/v)	51	<0.2	<430	<310
1,2,4-Trichlorobenzene	ppb(v/v)	<24	<1	<2100	<1600
1,2,4-Trimethylbenzene	ppb(v/v)	<4.9	0.07 J	<430	<310
tetrafluoroethane	ppb(v/v)	<4.9	<0.2	<430	<310
1,2-Dichlorobenzene	ppb(v/v)	<4.9	<0.2	<430	<310
1,2-Dichloroethane	ppb(v/v)	<4.9	<0.2	110 J	160 J
1,2-Dichloropropane	ppb(v/v)	<4.9	<0.2	<430	<310
1,3,5-Trimethylbenzene	ppb(v/v)	<4.9 J	<0.2 J	<430 J	<310 J
1,3-Dichlorobenzene	ppb(v/v)	<4.9	<0.2	<430	<310
1,4-Dichlorobenzene	ppb(v/v)	<4.9	<0.2	<430	<310
Benzene	ppb(v/v)	<4.9	0.13 J	<430	<310
Benzyl chloride	ppb(v/v)	<9.7	<0.4	<860	<630
Bromomethane	ppb(v/v)	<4.9	<0.2	<430	<310
Carbon tetrachloride	ppb(v/v)	480	0.94	<430	510
Chlorobenzene	ppb(v/v)	<4.9	<0.2	<430	<310
Chloroethane	ppb(v/v)	<4.9	<0.2	<430	<310
Chloroform	ppb(v/v)	1600 J	4.7	330 J	4200
Chloromethane	ppb(v/v)	6 J	0.54	<1100	<790
cis-1,2-Dichloroethene	ppb(v/v)	210	4.1	17000	25000
cis-1,3-Dichloropropene	ppb(v/v)	<4.9	<0.2	<430	<310
Dibromomethane	ppb(v/v)	<9.7	<0.4	<860	<630
Dichlorodifluoromethane	ppb(v/v)	6	0.5	<430	<310
Ethylbenzene	ppb(v/v)	<4.9	0.075 J	<430	<310
Hexachlorobutadiene	ppb(v/v)	<24	<1	<2100	<1600
Methylene chloride	ppb(v/v)	1.8 J	0.13 J	190 J	230 J
m-Xylene & p-Xylene	ppb(v/v)	<4.9	0.31	<430	<310
o-Xylene	ppb(v/v)	<4.9	0.1 J	<430	<310
Styrene	ppb(v/v)	<4.9	<0.2	<430	<310
Tetrachloroethene	ppb(v/v)	120	0.72	1000	1000
Toluene	ppb(v/v)	<4.9	0.31	<430	<310
trans-1,3-Dichloropropene	ppb(v/v)	<12	<0.5	<1100	<790
Trichloroethene	ppb(v/v)	700	17	37000	43000
Trichlorofluoromethane	ppb(v/v)	1.1 J	0.27	59 J	140 J
Vinyl chloride	ppb(v/v)	220 B	4.2 B	1400 B	710 B

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplilcate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-4
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM(BASELINE EVENT #4)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	SVE-D	SVE-E	SVE-F	SVE-F DUP
	Date	8/23/2007	8/23/2007	8/23/2007	8/23/2007
Analyte	Units				
1,1,1-Trichloroethane	ppb(v/v)	<250	<7.1	<0.2	<0.2
1,1,2,2-Tetrachloroethane	ppb(v/v)	26000	35	12	11
trifluoroethane	ppb(v/v)	<250	<7.1	0.081 J	0.073 J
1,1,2-Trichloroethane	ppb(v/v)	<250	<7.1	0.12 J	0.12 J
1,1-Dichloroethane	ppb(v/v)	<250	<7.1	<0.2	<0.2
1,1-Dichloroethene	ppb(v/v)	<250	<7.1	<0.2	<0.2
1,2,4-Trichlorobenzene	ppb(v/v)	<1300	<36	<1	<1
1,2,4-Trimethylbenzene	ppb(v/v)	<250	<7.1	0.071 J	0.067 J
tetrafluoroethane	ppb(v/v)	<250	<7.1	<0.2	<0.2
1,2-Dichlorobenzene	ppb(v/v)	<250	<7.1	<0.2	<0.2
1,2-Dichloroethane	ppb(v/v)	<250	<7.1	<0.2	<0.2
1,2-Dichloropropane	ppb(v/v)	<250	<7.1	<0.2	<0.2
1,3,5-Trimethylbenzene	ppb(v/v)	<250 J	<7.1 J	<0.2 J	<0.2 J
1,3-Dichlorobenzene	ppb(v/v)	<250	<7.1	<0.2	<0.2
1,4-Dichlorobenzene	ppb(v/v)	<250	<7.1	<0.2	<0.2
Benzene	ppb(v/v)	<250	<7.1	0.11 J	0.1 J
Benzyl chloride	ppb(v/v)	<500	<14	<0.4	<0.4
Bromomethane	ppb(v/v)	<250	<7.1	<0.2	<0.2
Carbon tetrachloride	ppb(v/v)	<250	5.5 J	0.88	0.85
Chlorobenzene	ppb(v/v)	<250	<7.1	<0.2	<0.2
Chloroethane	ppb(v/v)	<250	<7.1	<0.2	<0.2
Chloroform	ppb(v/v)	110 J	6.8 J	4.2	4.1
Chloromethane	ppb(v/v)	<630	<18	0.81	0.71
cis-1,2-Dichloroethene	ppb(v/v)	1600	28	3.8	3.6
cis-1,3-Dichloropropene	ppb(v/v)	<250	<7.1	<0.2	<0.2
Dibromomethane	ppb(v/v)	<500	<14	<0.4	<0.4
Dichlorodifluoromethane	ppb(v/v)	<250	<7.1	0.57	0.56
Ethylbenzene	ppb(v/v)	<250	<7.1	0.083 J	0.075 J
Hexachlorobutadiene	ppb(v/v)	<1300	<36	<1	<1
Methylene chloride	ppb(v/v)	160 J	<18	0.15 J	0.16 J
m-Xylene & p-Xylene	ppb(v/v)	<250	<7.1	0.29	0.28
o-Xylene	ppb(v/v)	<250	<7.1	0.095 J	0.088 J
Styrene	ppb(v/v)	<250	<7.1	<0.2	<0.2
Tetrachloroethene	ppb(v/v)	1500	4.8 J	0.62	0.58
Toluene	ppb(v/v)	<250	<7.1	0.25	0.24
trans-1,3-Dichloropropene	ppb(v/v)	<630	<18	<0.5	<0.5
Trichloroethene	ppb(v/v)	37000	540	15	14
Trichlorofluoromethane	ppb(v/v)	60 J	<7.1	0.28	0.27
Vinyl chloride	ppb(v/v)	820 B	25 B	2 B	1.9

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplilcate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-4
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM(BASELINE EVENT #4)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	SVE-G	SVE-INF	SVE-INF DUP	SVE-MID
	Date	8/23/2007	8/23/2007	8/23/2007	8/23/2007
Analyte	Units				
1,1,1-Trichloroethane	ppb(v/v)	<320	<130	<210	<660
1,1,2,2-Tetrachloroethane	ppb(v/v)	13000	8500	1100	<660
trifluoroethane	ppb(v/v)	<320	<130	<210	<660
1,1,2-Trichloroethane	ppb(v/v)	470	110 J	100 J	<660
1,1-Dichloroethane	ppb(v/v)	<320	<130	<210	<660
1,1-Dichloroethene	ppb(v/v)	<320	<130	<210	<660
1,2,4-Trichlorobenzene	ppb(v/v)	<1600	<670	<1100	<3300
1,2,4-Trimethylbenzene	ppb(v/v)	<320	<130	<210	<660
tetrafluoroethane	ppb(v/v)	<320	<130	<210	<660
1,2-Dichlorobenzene	ppb(v/v)	<320	<130	<210	<660
1,2-Dichloroethane	ppb(v/v)	<320	<130	<210	<660
1,2-Dichloropropane	ppb(v/v)	<320	<130	<210	<660
1,3,5-Trimethylbenzene	ppb(v/v)	<320 J	<130 J	<210 J	<660 J
1,3-Dichlorobenzene	ppb(v/v)	<320	<130	<210	<660
1,4-Dichlorobenzene	ppb(v/v)	<320	<130	<210	<660
Benzene	ppb(v/v)	<320	<130	<210	<660
Benzyl chloride	ppb(v/v)	<650	<270	<420	<1300
Bromomethane	ppb(v/v)	<320	<130	<210	<660
Carbon tetrachloride	ppb(v/v)	10000	750	1800	2100
Chlorobenzene	ppb(v/v)	<320	<130	<210	<660
Chloroethane	ppb(v/v)	<320	<130	<210	<660
Chloroform	ppb(v/v)	94000	4000	11000	10000
Chloromethane	ppb(v/v)	<810	<340	<530	<1600
cis-1,2-Dichloroethene	ppb(v/v)	1400	3500	9400	7700
cis-1,3-Dichloropropene	ppb(v/v)	<320	<130	<210	<660
Dibromomethane	ppb(v/v)	<650	<270	<420	<1300
Dichlorodifluoromethane	ppb(v/v)	<320	<130	<210	<660
Ethylbenzene	ppb(v/v)	<320	<130	<210	<660
Hexachlorobutadiene	ppb(v/v)	<1600	<670	<1100	<3300
Methylene chloride	ppb(v/v)	280 J	120 J	160 J	260 J
m-Xylene & p-Xylene	ppb(v/v)	<320	<130	<210	<660
o-Xylene	ppb(v/v)	<320	<130	<210	<660
Styrene	ppb(v/v)	<320	<130	<210	<660
Tetrachloroethene	ppb(v/v)	2800	530	300	<660
Toluene	ppb(v/v)	<320	<130	<210	<660
trans-1,3-Dichloropropene	ppb(v/v)	<810	<340	<530	<1600
Trichloroethene	ppb(v/v)	27000	14000	28000	42000
Trichlorofluoromethane	ppb(v/v)	76 J	31 J	60 J	<660
Vinyl chloride	ppb(v/v)	770 B	280 B	620 B	2300 B

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplilcate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-4
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM(BASELINE EVENT #4)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	SVE-EFF	SVE-EFF DUP
	Date	8/23/2007	8/23/2007
Analyte	Units		
1,1,1-Trichloroethane	ppb(v/v)	<0.2	<0.2
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.58	0.61
trifluoroethane	ppb(v/v)	<0.2	<0.2
1,1,2-Trichloroethane	ppb(v/v)	<0.2	<0.2
1,1-Dichloroethane	ppb(v/v)	<0.2	<0.2
1,1-Dichloroethene	ppb(v/v)	<0.2	<0.2
1,2,4-Trichlorobenzene	ppb(v/v)	<1	<1
1,2,4-Trimethylbenzene	ppb(v/v)	<0.2	<0.2
tetrafluoroethane	ppb(v/v)	<0.2	<0.2
1,2-Dichlorobenzene	ppb(v/v)	<0.2	<0.2
1,2-Dichloroethane	ppb(v/v)	<0.2	<0.2
1,2-Dichloropropane	ppb(v/v)	<0.2	<0.2
1,3,5-Trimethylbenzene	ppb(v/v)	<0.2 J	<0.2 J
1,3-Dichlorobenzene	ppb(v/v)	<0.2	<0.2
1,4-Dichlorobenzene	ppb(v/v)	<0.2	<0.2
Benzene	ppb(v/v)	0.079 J	<0.2
Benzyl chloride	ppb(v/v)	<0.4	<0.4
Bromomethane	ppb(v/v)	<0.2	<0.2
Carbon tetrachloride	ppb(v/v)	0.038 J	0.047 J
Chlorobenzene	ppb(v/v)	<0.2	<0.2
Chloroethane	ppb(v/v)	0.1 J	0.14 J
Chloroform	ppb(v/v)	1.5	1.6
Chloromethane	ppb(v/v)	0.16 J	0.17 J
cis-1,2-Dichloroethene	ppb(v/v)	8.1	8.5
cis-1,3-Dichloropropene	ppb(v/v)	<0.2	<0.2
Dibromomethane	ppb(v/v)	<0.4	<0.4
Dichlorodifluoromethane	ppb(v/v)	0.34	0.33
Ethylbenzene	ppb(v/v)	0.091 J	0.096 J
Hexachlorobutadiene	ppb(v/v)	<1	<1
Methylene chloride	ppb(v/v)	3.3	3.5
m-Xylene & p-Xylene	ppb(v/v)	0.49	0.53
o-Xylene	ppb(v/v)	0.4	0.45
Styrene	ppb(v/v)	<0.2	<0.2
Tetrachloroethene	ppb(v/v)	0.08 J	0.076 J
Toluene	ppb(v/v)	0.16 J	0.18 J
trans-1,3-Dichloropropene	ppb(v/v)	<0.5	<0.5
Trichloroethene	ppb(v/v)	1.6	1.7
Trichlorofluoromethane	ppb(v/v)	0.05 J	0.058 J
Vinyl chloride	ppb(v/v)	26 B	32

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplilcate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-5
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (BASELINE EVENT #5)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Units	SVE-A 9/19/2007	SVE-B 9/19/2007	SVE-C 9/19/2007	SVE-D 9/19/2007
1,1,1-Trichloroethane	ppb(v/v)	3.4 J	<0.2	<80	<2.9
1,1,2,2-Tetrachloroethane	ppb(v/v)	4.4 J	1.9	1900	81
trifluoroethane	ppb(v/v)	<7.5	0.11 J	<80	<2.9
1,1,2-Trichloroethane	ppb(v/v)	<7.5	<0.2	<80	<2.9
1,1-Dichloroethane	ppb(v/v)	<7.5	<0.2	<80	<2.9
1,1-Dichloroethene	ppb(v/v)	270	0.11 J	<80	<2.9
1,2,4-Trichlorobenzene	ppb(v/v)	<38	<1	<400	<14
1,2,4-Trimethylbenzene	ppb(v/v)	<7.5	<0.2	<80	<2.9
tetrafluoroethane	ppb(v/v)	<7.5	<0.2	<80	<2.9
1,2-Dichlorobenzene	ppb(v/v)	<7.5	<0.2	<80	<2.9
1,2-Dichloroethane	ppb(v/v)	4.2 J	<0.2	<80	<2.9
1,2-Dichloropropane	ppb(v/v)	<7.5	<0.2	<80	<2.9
1,3,5-Trimethylbenzene	ppb(v/v)	<7.5	<0.2	<80	<2.9
1,3-Dichlorobenzene	ppb(v/v)	<7.5	<0.2	<80	<2.9
1,4-Dichlorobenzene	ppb(v/v)	<7.5	<0.2	<80	<2.9
Benzene	ppb(v/v)	<7.5	0.17 J	<80	<2.9
Benzyl chloride	ppb(v/v)	<15	<0.4	<160	<5.7
Bromomethane	ppb(v/v)	<7.5	<0.2	<80	<2.9
Carbon tetrachloride	ppb(v/v)	1400	0.8	<80	0.54 J
Chlorobenzene	ppb(v/v)	<7.5	<0.2	<80	<2.9
Chloroethane	ppb(v/v)	<7.5	<0.2	<80	<2.9
Chloroform	ppb(v/v)	7200	3.8	76 J	6.3
Chloromethane	ppb(v/v)	<19	0.71	<200	<7.1
cis-1,2-Dichloroethene	ppb(v/v)	240	4.7	2700	26
cis-1,3-Dichloropropene	ppb(v/v)	<7.5	<0.2	<80	<2.9
Dibromomethane	ppb(v/v)	<15	<0.4	<160	<5.7
Dichlorodifluoromethane	ppb(v/v)	<7.5	0.5	<80	<2.9
Ethylbenzene	ppb(v/v)	<7.5	<0.2	<80	<2.9
Hexachlorobutadiene	ppb(v/v)	<38	<1	<400	<14
Methylene chloride	ppb(v/v)	2.4 J	0.15 J	250	<7.1
m-Xylene & p-Xylene	ppb(v/v)	<7.5	0.14 J	<80	<2.9
o-Xylene	ppb(v/v)	<7.5	0.07 J	<80	<2.9
Styrene	ppb(v/v)	<7.5	<0.2	<80	<2.9
Tetrachloroethene	ppb(v/v)	420	0.21	190	9.7
Toluene	ppb(v/v)	<7.5	0.3	<80	<2.9
trans-1,3-Dichloropropene	ppb(v/v)	<19	<0.5	<200	<7.1
Trichloroethene	ppb(v/v)	1600	15	7300	370
Trichlorofluoromethane	ppb(v/v)	1.1 J	0.23	<80	<2.9
Vinyl chloride	ppb(v/v)	3.4 J	0.12 J	<80	<2.9

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-5
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (BASELINE EVENT #5)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	SVE-E	SVE-F	SVE-G	SVE-INF
	Date	9/19/2007	9/19/2007	9/19/2007	9/19/2007
Analyte	Units				
1,1,1-Trichloroethane	ppb(v/v)	<30	<0.2	<80	25 J
1,1,2,2-Tetrachloroethane	ppb(v/v)	740	0.95	4000	610
trifluoroethane	ppb(v/v)	<30	0.11 J	<80	34 J
1,1,2-Trichloroethane	ppb(v/v)	<30	<0.2	79 J	<96
1,1-Dichloroethane	ppb(v/v)	<30	<0.2	<80	<96
1,1-Dichloroethene	ppb(v/v)	<30	0.13 J	<80	100
1,2,4-Trichlorobenzene	ppb(v/v)	<150	<1	<400	<480
1,2,4-Trimethylbenzene	ppb(v/v)	<30	<0.2	<80	<96
tetrafluoroethane	ppb(v/v)	<30	<0.2	<80	<96
1,2-Dichlorobenzene	ppb(v/v)	<30	<0.2	<80	<96
1,2-Dichloroethane	ppb(v/v)	<30	<0.2	24 J	<96
1,2-Dichloropropane	ppb(v/v)	<30	<0.2	<80	<96
1,3,5-Trimethylbenzene	ppb(v/v)	<30	<0.2	<80	<96
1,3-Dichlorobenzene	ppb(v/v)	<30	<0.2	<80	<96
1,4-Dichlorobenzene	ppb(v/v)	<30	<0.2	<80	<96
Benzene	ppb(v/v)	<30	0.16 J	<80	<96
Benzyl chloride	ppb(v/v)	<60	<0.4	<160	<190
Bromomethane	ppb(v/v)	<30	<0.2	<80	<96
Carbon tetrachloride	ppb(v/v)	33	0.91	4400	530
Chlorobenzene	ppb(v/v)	<30	<0.2	<80	<96
Chloroethane	ppb(v/v)	<30	<0.2	<80	<96
Chloroform	ppb(v/v)	30	4.6	22000	2300
Chloromethane	ppb(v/v)	<74	0.89	<200	<240
cis-1,2-Dichloroethene	ppb(v/v)	340	5.8	260	2400
cis-1,3-Dichloropropene	ppb(v/v)	<30	<0.2	<80	<96
Dibromomethane	ppb(v/v)	<60	<0.4	<160	<190
Dichlorodifluoromethane	ppb(v/v)	<30	0.53	<80	<96
Ethylbenzene	ppb(v/v)	<30	<0.2	<80	<96
Hexachlorobutadiene	ppb(v/v)	<150	<1	<400	<480
Methylene chloride	ppb(v/v)	<74	0.26 J	110 J	52 J
m-Xylene & p-Xylene	ppb(v/v)	<30	<0.2	<80	<96
o-Xylene	ppb(v/v)	<30	<0.2	<80	<96
Styrene	ppb(v/v)	<30	<0.2	<80	<96
Tetrachloroethene	ppb(v/v)	63	0.2	1300	260
Toluene	ppb(v/v)	<30	0.23	<80	82 J
trans-1,3-Dichloropropene	ppb(v/v)	<74	<0.5	<200	<240
Trichloroethene	ppb(v/v)	5200	19	5900	8500
Trichlorofluoromethane	ppb(v/v)	<30	0.25	<80	<96
Vinyl chloride	ppb(v/v)	<30	0.18 J	<80	100

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection lir
Units: ppb v/v: parts per billion volume per v

TABLE B-5
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (BASELINE EVENT #5)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	SVE-INF DUP	SVE-MID	SVE-EFF
	Date	9/19/2007	9/19/2007	9/19/2007
Analyte	Units			
1,1,1-Trichloroethane	ppb(v/v)	<96	<170	<170
1,1,2,2-Tetrachloroethane	ppb(v/v)	2100	83 J	70 J
trifluoroethane	ppb(v/v)	30 J	<170	<170
1,1,2-Trichloroethane	ppb(v/v)	<96	<170	<170
1,1-Dichloroethane	ppb(v/v)	<96	<170	<170
1,1-Dichloroethene	ppb(v/v)	88 J	110 J	80 J
1,2,4-Trichlorobenzene	ppb(v/v)	<480	<860	<860
1,2,4-Trimethylbenzene	ppb(v/v)	<96	<170	<170
tetrafluoroethane	ppb(v/v)	<96	<170	<170
1,2-Dichlorobenzene	ppb(v/v)	<96	<170	<170
1,2-Dichloroethane	ppb(v/v)	<96	<170	<170
1,2-Dichloropropane	ppb(v/v)	<96	<170	<170
1,3,5-Trimethylbenzene	ppb(v/v)	<96	<170	<170
1,3-Dichlorobenzene	ppb(v/v)	<96	<170	<170
1,4-Dichlorobenzene	ppb(v/v)	<96	<170	<170
Benzene	ppb(v/v)	<96	<170	<170
Benzyl chloride	ppb(v/v)	<190	<340	<340
Bromomethane	ppb(v/v)	<96	<170	<170
Carbon tetrachloride	ppb(v/v)	470	610	790
Chlorobenzene	ppb(v/v)	<96	<170	<170
Chloroethane	ppb(v/v)	<96	<170	<170
Chloroform	ppb(v/v)	2100	2500	3100
Chloromethane	ppb(v/v)	<240	<430	<430
cis-1,2-Dichloroethene	ppb(v/v)	2400	2400	3200
cis-1,3-Dichloropropene	ppb(v/v)	<96	<170	<170
Dibromomethane	ppb(v/v)	<190	<340	<340
Dichlorodifluoromethane	ppb(v/v)	<96	<170	<170
Ethylbenzene	ppb(v/v)	<96	<170	<170
Hexachlorobutadiene	ppb(v/v)	<480	<860	<860
Methylene chloride	ppb(v/v)	30 J	110 J	130 J
m-Xylene & p-Xylene	ppb(v/v)	<96	<170	<170
o-Xylene	ppb(v/v)	<96	<170	<170
Styrene	ppb(v/v)	<96	<170	<170
Tetrachloroethene	ppb(v/v)	340	<170	<170
Toluene	ppb(v/v)	35 J	54 J	<170
trans-1,3-Dichloropropene	ppb(v/v)	<240	<430	<430
Trichloroethene	ppb(v/v)	7700	16000	12000
Trichlorofluoromethane	ppb(v/v)	<96	<170	<170
Vinyl chloride	ppb(v/v)	87 J	130 J	120 J

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection lir
Units: ppb v/v: parts per billion volume per v

TABLE B-6
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (4Q07 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Event Units	SVE-A 10/18/2007 SVE Q407	SVE-B 10/18/2007 SVE Q407	SVE-C 10/18/2007 SVE Q407
1,1,1-Trichloroethane	ppb v/v	2.1 J	<0.2	<200
1,1,2,2-Tetrachloroethane	ppb v/v	14	3.3	3200
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<2.3	0.18 J	<200
1,1,2-Trichloroethane	ppb v/v	1.7 J	<0.2	<200
1,1-Dichloroethane	ppb v/v	2 J	<0.2	<200
1,1-Dichloroethene	ppb v/v	130	<0.2	<200
1,2,4-Trichlorobenzene	ppb v/v	<11 J	<1 J	<1000 J
1,2,4-Trimethylbenzene	ppb v/v	<2.3	<0.2	<200
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<2.3	<0.2	<200
1,2-Dichlorobenzene	ppb v/v	<2.3	<0.2	<200
1,2-Dichloroethane	ppb v/v	2.5	<0.2	<200
1,2-Dichloropropane	ppb v/v	<2.3	<0.2	<200
1,3,5-Trimethylbenzene	ppb v/v	<2.3	<0.2	<200
1,3-Dichlorobenzene	ppb v/v	<2.3	<0.2	<200
1,4-Dichlorobenzene	ppb v/v	<2.3	<0.2	<200
Benzene	ppb v/v	<2.3	0.14 J	<200
Benzyl chloride	ppb v/v	<4.6	<0.4	<410
Bromomethane	ppb v/v	<2.3	<0.2	<200
Carbon tetrachloride	ppb v/v	680	0.36	<200
Chlorobenzene	ppb v/v	<2.3	<0.2	<200
Chloroethane	ppb v/v	<2.3	<0.2	<200
Chloroform	ppb v/v	4200	1.6	110 J
Chloromethane	ppb v/v	<5.7	0.73	<510
cis-1,2-Dichloroethene	ppb v/v	120	1.2	3300
cis-1,3-Dichloropropene	ppb v/v	<2.3	<0.2	<200
Dibromomethane	ppb v/v	<4.6	<0.4	<410
Dichlorodifluoromethane	ppb v/v	<2.3	0.43	<200
Ethylbenzene	ppb v/v	<2.3	0.5	<200
Hexachlorobutadiene	ppb v/v	<11	<1	<1000
Methylene chloride	ppb v/v	1 J,B	0.2 J,B	110 J,B
m-Xylene & p-Xylene	ppb v/v	<2.3	1.6	<200
o-Xylene	ppb v/v	<2.3	0.51	<200
Styrene	ppb v/v	<2.3	<0.2	<200
Tetrachloroethene	ppb v/v	260	0.78	340
Toluene	ppb v/v	<2.3	0.38	<200
trans-1,3-Dichloropropene	ppb v/v	<5.7	<0.5	<510
Trichloroethene	ppb v/v	1100	6	16000
Trichlorofluoromethane	ppb v/v	0.33 J	0.2	<200
Vinyl chloride	ppb v/v	<2.3	0.095 J	<200

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-6
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (4Q07 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Event Units	SVE-D 10/18/2007 SVE Q407	SVE-E 10/18/2007 SVE Q407	SVE-E DUP 10/18/2007 SVE Q407
1,1,1-Trichloroethane	ppb v/v	<60	<0.2	<0.2
1,1,2,2-Tetrachloroethane	ppb v/v	3700	3.1	2.3
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<60	0.18 J	0.14 J
1,1,2-Trichloroethane	ppb v/v	<60	<0.2	<0.2
1,1-Dichloroethane	ppb v/v	<60	<0.2	<0.2
1,1-Dichloroethene	ppb v/v	<60	<0.2	<0.2
1,2,4-Trichlorobenzene	ppb v/v	<300 J	<1 J	<1 J
1,2,4-Trimethylbenzene	ppb v/v	<60	<0.2	0.073 J
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<60	<0.2	<0.2
1,2-Dichlorobenzene	ppb v/v	<60	<0.2	<0.2
1,2-Dichloroethane	ppb v/v	<60	<0.2	<0.2
1,2-Dichloropropane	ppb v/v	<60	<0.2	<0.2
1,3,5-Trimethylbenzene	ppb v/v	<60	<0.2	<0.2
1,3-Dichlorobenzene	ppb v/v	<60	<0.2	<0.2
1,4-Dichlorobenzene	ppb v/v	<60	<0.2	<0.2
Benzene	ppb v/v	<60	0.18 J	0.17 J
Benzyl chloride	ppb v/v	<120	<0.4	<0.4
Bromomethane	ppb v/v	<60	<0.2	<0.2
Carbon tetrachloride	ppb v/v	<60	0.33	0.27
Chlorobenzene	ppb v/v	<60	<0.2	<0.2
Chloroethane	ppb v/v	<60	<0.2	<0.2
Chloroform	ppb v/v	35 J	1.4	1.1
Chloromethane	ppb v/v	<150	0.83	0.67
cis-1,2-Dichloroethene	ppb v/v	210	1.1	0.85
cis-1,3-Dichloropropene	ppb v/v	<60	<0.2	<0.2
Dibromomethane	ppb v/v	<120	<0.4	<0.4
Dichlorodifluoromethane	ppb v/v	<60	0.48	0.42
Ethylbenzene	ppb v/v	<60	0.49	0.85
Hexachlorobutadiene	ppb v/v	<300	<1	<1
Methylene chloride	ppb v/v	34 J,B	0.34 J,B	0.21 J,B
m-Xylene & p-Xylene	ppb v/v	<60	1.7	2.9
o-Xylene	ppb v/v	<60	0.53	0.86
Styrene	ppb v/v	<60	<0.2	0.079 J
Tetrachloroethene	ppb v/v	450	0.73	0.91
Toluene	ppb v/v	<60	0.42	0.66
trans-1,3-Dichloropropene	ppb v/v	<150	<0.5	<0.5
Trichloroethene	ppb v/v	4600	5.5	4.2
Trichlorofluoromethane	ppb v/v	<60	0.23	0.19 J
Vinyl chloride	ppb v/v	21 J	0.095 J	0.086 J

Notes:
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DUP: Duplicate Sample
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Units: ppb v/v: parts per billion volume per volume

TABLE B-6
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (4Q07 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Event Units	SVE-F 10/18/2007 SVE Q407	SVE-G 10/18/2007 SVE Q407	SVE-INF 10/18/2007 SVE Q407
1,1,1-Trichloroethane	ppb v/v	0.037 J	<21	26 J
1,1,2,2-Tetrachloroethane	ppb v/v	2.8	1100	3100
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	0.19 J	<21	170
1,1,2-Trichloroethane	ppb v/v	<0.2	16 J	<100
1,1-Dichloroethane	ppb v/v	<0.2	<21	<100
1,1-Dichloroethene	ppb v/v	<0.2	<21	110
1,2,4-Trichlorobenzene	ppb v/v	<1 J	<110 J	<510 J
1,2,4-Trimethylbenzene	ppb v/v	0.068 J	<21	<100
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<0.2	<21	<100
1,2-Dichlorobenzene	ppb v/v	<0.2	<21	<100
1,2-Dichloroethane	ppb v/v	<0.2	<21	<100
1,2-Dichloropropane	ppb v/v	<0.2	<21	<100
1,3,5-Trimethylbenzene	ppb v/v	<0.2	<21	<100
1,3-Dichlorobenzene	ppb v/v	<0.2	<21	<100
1,4-Dichlorobenzene	ppb v/v	<0.2	<21	<100
Benzene	ppb v/v	0.18 J	<21	<100
Benzyl chloride	ppb v/v	<0.4	<42	<200
Bromomethane	ppb v/v	<0.2	<21	<100
Carbon tetrachloride	ppb v/v	0.32	1400	380
Chlorobenzene	ppb v/v	<0.2	<21	<100
Chloroethane	ppb v/v	<0.2	<21	<100
Chloroform	ppb v/v	1.5	6200	2000
Chloromethane	ppb v/v	0.96	<53	<250
cis-1,2-Dichloroethene	ppb v/v	1	73	1600
cis-1,3-Dichloropropene	ppb v/v	<0.2	<21	<100
Dibromomethane	ppb v/v	<0.4	<42	<200
Dichlorodifluoromethane	ppb v/v	0.47	<21	<100
Ethylbenzene	ppb v/v	0.5	<21	<100
Hexachlorobutadiene	ppb v/v	<1	<110	<510
Methylene chloride	ppb v/v	0.37 J,B	31 J,B	72 J,B
m-Xylene & p-Xylene	ppb v/v	1.8	<21	<100
o-Xylene	ppb v/v	0.54	<21	<100
Styrene	ppb v/v	<0.2	<21	<100
Tetrachloroethene	ppb v/v	0.86	390	470
Toluene	ppb v/v	0.43	<21	<100
trans-1,3-Dichloropropene	ppb v/v	<0.5	<53	<250
Trichloroethene	ppb v/v	5.3	1500	8100
Trichlorofluoromethane	ppb v/v	0.22	<21	<100
Vinyl chloride	ppb v/v	0.1 J	<21	91 J

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-7
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (1Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Units	SVE-A 1/17/2008	SVE-B 1/17/2008	SVE-C 1/17/2008	SVE-D 1/17/2008	SVE-E 1/17/2008
1,1,1-Trichloroethane	ppb v/v	<50	<0.8	<170	<40	<0.8
1,1,2,2-Tetrachloroethane	ppb v/v	730	10	410	4500	14
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<50	0.83	<170	<40	0.95
1,1,2-Trichloroethane	ppb v/v	<50	<0.8	<170	<40	<0.8
1,1-Dichloroethane	ppb v/v	<50	<0.8	<170	<40	<0.8
1,1-Dichloroethene	ppb v/v	55	0.67 J	<170	<40	0.7 J
1,2,4-Trichlorobenzene	ppb v/v	<250	<4	<830	<200	<4
1,2,4-Trimethylbenzene	ppb v/v	<50	<0.8	<170	<40	<0.8
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<50	<0.8	<170	<40	<0.8
1,2-Dichlorobenzene	ppb v/v	<50	<0.8	<170	<40	<0.8
1,2-Dichloroethane	ppb v/v	<50	<0.8	<170	<40	<0.8
1,2-Dichloropropane	ppb v/v	<50	<0.8	<170	<40	<0.8
1,3,5-Trimethylbenzene	ppb v/v	<50	<0.8	<170	<40	<0.8
1,3-Dichlorobenzene	ppb v/v	<50	<0.8	<170	<40	<0.8
1,4-Dichlorobenzene	ppb v/v	<50	<0.8	<170	<40	<0.8
Benzene	ppb v/v	<50	0.53 J	<170	<40	0.91
Benzyl chloride	ppb v/v	<100	<1.6	<330	<80	<1.6
Bromomethane	ppb v/v	<50	<0.8	<170	<40	<0.8
Carbon tetrachloride	ppb v/v	850	2.2	<170	<40	2.5
Chlorobenzene	ppb v/v	<50	<0.8	<170	<40	<0.8
Chloroethane	ppb v/v	<50	<0.8	<170	<40	<0.8
Chloroform	ppb v/v	5300	16	60 J	38 J	17
Chloromethane	ppb v/v	<120	<2	<420	<100	<2
cis-1,2-Dichloroethene	ppb v/v	140	17	2100	140	18
cis-1,3-Dichloropropene	ppb v/v	<50	<0.8	<170	<40	<0.8
Dibromomethane	ppb v/v	<100	<1.6	<330	<80	<1.6
Dichlorodifluoromethane	ppb v/v	<50	0.58 J	<170	<40	0.78 J
Ethylbenzene	ppb v/v	<50	<0.8	<170	<40	<0.8
Hexachlorobutadiene	ppb v/v	<250	<4	<830	<200	<4
Methylene chloride	ppb v/v	30 J,B	0.63 J,B	310 J,B	17 J,B	0.62 J,B
m-Xylene & p-Xylene	ppb v/v	<50	<0.8	<170	<40	<0.8
o-Xylene	ppb v/v	<50	<0.8	<170	<40	<0.8
Styrene	ppb v/v	<50	<0.8	<170	<40	<0.8
Tetrachloroethene	ppb v/v	190	2.5	170	300	3.5
Toluene	ppb v/v	<50	0.6 J	<170	<40	0.73 J
trans-1,3-Dichloropropene	ppb v/v	<120	<2	<420	<100	<2
Trichloroethene	ppb v/v	720	51	13000	3100	68
Trichlorofluoromethane	ppb v/v	<50	0.28 J	<170	<40	0.35 J
Vinyl chloride	ppb v/v	<50	1.6	<170	<40	2.1

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-7
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (1Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location / Date / Units	SVE-F 1/17/2008	SVE-G 1/17/2008	SVE-G DUP 1/17/2008	SVE-INF 1/17/2008	SVE-INF DUP 1/17/2008
1,1,1-Trichloroethane	ppb v/v	<8	<330	<330	21 J	26 J
1,1,2,2-Tetrachloroethane	ppb v/v	9.9	450	440	1000	1400
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<8	<330	<330	160	160
1,1,2-Trichloroethane	ppb v/v	<8	<330	<330	<95	<93
1,1-Dichloroethane	ppb v/v	<8	<330	<330	<95	<93
1,1-Dichloroethene	ppb v/v	<8	<330	<330	110	110
1,2,4-Trichlorobenzene	ppb v/v	<40	<1600	<1600	<480	<470
1,2,4-Trimethylbenzene	ppb v/v	<8	<330	<330	<95	<93
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<8	<330	<330	<95	<93
1,2-Dichlorobenzene	ppb v/v	<8	<330	<330	<95	<93
1,2-Dichloroethane	ppb v/v	<8	<330	<330	<95	<93
1,2-Dichloropropane	ppb v/v	<8	<330	<330	<95	<93
1,3,5-Trimethylbenzene	ppb v/v	<8	<330	<330	<95	<93
1,3-Dichlorobenzene	ppb v/v	<8	<330	<330	<95	<93
1,4-Dichlorobenzene	ppb v/v	<8	<330	<330	<95	<93
Benzene	ppb v/v	<8	<330	<330	29 J	<93
Benzyl chloride	ppb v/v	<16	<660	<660	<190	<190
Bromomethane	ppb v/v	<8	<330	<330	<95	<93
Carbon tetrachloride	ppb v/v	2.4 J	1500	1300	340	350
Chlorobenzene	ppb v/v	<8	<330	<330	<95	<93
Chloroethane	ppb v/v	<8	<330	<330	<95	<93
Chloroform	ppb v/v	21	32000	30000	3100	3100
Chloromethane	ppb v/v	<20	350 J	<820	<240	<230
cis-1,2-Dichloroethene	ppb v/v	22	210 J	200 J	3500	3400
cis-1,3-Dichloropropene	ppb v/v	<8	<330	<330	<95	<93
Dibromomethane	ppb v/v	<16	<660	<660	<190	<190
Dichlorodifluoromethane	ppb v/v	<8	<330	<330	<95	<93
Ethylbenzene	ppb v/v	<8	<330	<330	<95	<93
Hexachlorobutadiene	ppb v/v	<40	<1600	<1600	<480	<470
Methylene chloride	ppb v/v	4.7 J,B	270 J,B	240 J,B	100 J,B	110 J,B
m-Xylene & p-Xylene	ppb v/v	<8	<330	<330	<95	<93
o-Xylene	ppb v/v	<8	<330	<330	<95	<93
Styrene	ppb v/v	<8	<330	<330	<95	<93
Tetrachloroethene	ppb v/v	860	1100	1000	330	290
Toluene	ppb v/v	<8	<330	<330	39 J	<93
trans-1,3-Dichloropropene	ppb v/v	<20	<820	<820	<240	<230
Trichloroethene	ppb v/v	68	5500	5000	11000	10000
Trichlorofluoromethane	ppb v/v	<8	<330	<330	<95	<93
Vinyl chloride	ppb v/v	<8	<330	<330	290	300

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-8
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (2Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location / Date / Units	SVE-A 4/24/2008	SVE-B 4/24/2008	SVE-B DUP 4/24/2008	SVE-C 4/24/2008	SVE-D 5/6/2008
1,1,1-Trichloroethane	ppb v/v	<2	<0.2	<0.2	<99	<19
1,1,2,2-Tetrachloroethane	ppb v/v	76	1.5	0.32	500	4300
trifluoroethane	ppb v/v	<2	0.13 J	0.13 J	<99	<19
1,1,2-Trichloroethane	ppb v/v	<2	<0.2	<0.2	<99	5.3 J
1,1-Dichloroethane	ppb v/v	0.37 J	<0.2	<0.2	<99	<19
1,1-Dichloroethene	ppb v/v	6.3	<0.2	0.063 J	31 J	<19
1,2,4-Trichlorobenzene	ppb v/v	<10	<1	<1	<500	<94
1,2,4-Trimethylbenzene	ppb v/v	<2	0.19 J	<0.2	<99	<19
tetrafluoroethane	ppb v/v	<2	<0.2	<0.2	<99	<19
1,2-Dichlorobenzene	ppb v/v	<2	<0.2	<0.2	<99	<19
1,2-Dichloroethane	ppb v/v	<2	<0.2	<0.2	<99	<19
1,2-Dichloropropane	ppb v/v	<2	<0.2	<0.2	<99	<19
1,3,5-Trimethylbenzene	ppb v/v	<2	<0.2	<0.2	<99	<19
1,3-Dichlorobenzene	ppb v/v	<2	<0.2	<0.2	<99	<19
1,4-Dichlorobenzene	ppb v/v	<2	0.1 J	<0.2	<99	<19
Benzene	ppb v/v	<2	0.69	0.36	34 J	<19
Benzyl chloride	ppb v/v	<4	<0.4	<0.4	<200	<38
Bromomethane	ppb v/v	<2	<0.2	<0.2	<99	<19
Carbon tetrachloride	ppb v/v	76	0.12 J	0.17 J	<99	<19
Chlorobenzene	ppb v/v	<2	<0.2	0.58	<99	<19
Chloroethane	ppb v/v	<2	<0.2	<0.2	<99	<19
Chloroform	ppb v/v	4800	0.48	0.67	170	7 J
Chloromethane	ppb v/v	<5	0.8	1.1	<250	<47
cis-1,2-Dichloroethene	ppb v/v	21	1.3	1	2500	110
cis-1,3-Dichloropropene	ppb v/v	<2	<0.2	<0.2	<99	<19
Dibromomethane	ppb v/v	<4	<0.4	<0.4	<200	<38
Dichlorodifluoromethane	ppb v/v	<2	0.65	0.69	<99	<19
Ethylbenzene	ppb v/v	<2	0.15 J	<0.2	<99	<19
Hexachlorobutadiene	ppb v/v	<10	<1	<1	<500	<94
Methylene chloride	ppb v/v	1.1 J,B	0.52 B	0.98	180 J,B	18 J,B
m-Xylene & p-Xylene	ppb v/v	<2	0.56	<0.2	<99	<19
o-Xylene	ppb v/v	<2	0.22	<0.2	<99	<19
Styrene	ppb v/v	<2	0.093 J	<0.2	<99	<19
Tetrachloroethene	ppb v/v	22	0.062 J	0.094 J	180	190
Toluene	ppb v/v	<2	0.97	3.5	31 J	5.2 J
trans-1,3-Dichloropropene	ppb v/v	<5	<0.5	<0.5	<250	<47
Trichloroethene	ppb v/v	94	2	2.6	13000	2600
Trichlorofluoromethane	ppb v/v	<2	0.3	0.32	<99	<19
Vinyl chloride	ppb v/v	<2	<0.2	0.077 J	<99	<19

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-8
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (2Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location / Date / Units	SVE-E 4/24/2008	SVE-F 4/24/2008	SVE-G 4/24/2008	SVE-INF 4/24/2008
1,1,1-Trichloroethane	ppb v/v	<0.2	<0.2	<0.2	25 J
1,1,2,2-Tetrachloroethane	ppb v/v	2.7	<0.2	9.5	1800
trifluoroethane	ppb v/v	0.12 J	0.13 J	0.11 J	74
1,1,2-Trichloroethane	ppb v/v	0.21	<0.2	0.06 J	24 J
1,1-Dichloroethane	ppb v/v	<0.2	<0.2	<0.2	<54
1,1-Dichloroethene	ppb v/v	0.096 J	0.056 J	<0.2	120
1,2,4-Trichlorobenzene	ppb v/v	<1	<1	<1	<270
1,2,4-Trimethylbenzene	ppb v/v	0.15 J	<0.2	0.14 J	<54
tetrafluoroethane	ppb v/v	<0.2	<0.2	<0.2	<54
1,2-Dichlorobenzene	ppb v/v	<0.2	<0.2	<0.2	<54
1,2-Dichloroethane	ppb v/v	<0.2	<0.2	<0.2	<54
1,2-Dichloropropane	ppb v/v	<0.2	<0.2	<0.2	<54
1,3,5-Trimethylbenzene	ppb v/v	<0.2	<0.2	<0.2	<54
1,3-Dichlorobenzene	ppb v/v	<0.2	<0.2	<0.2	<54
1,4-Dichlorobenzene	ppb v/v	0.25	<0.2	<0.2	<54
Benzene	ppb v/v	0.81	0.23	0.7	<54
Benzyl chloride	ppb v/v	<0.4	<0.4	<0.4	<110
Bromomethane	ppb v/v	<0.2	0.041 J	0.098 J	<54
Carbon tetrachloride	ppb v/v	1.3	0.13 J	0.17 J	160
Chlorobenzene	ppb v/v	<0.2	<0.2	<0.2	<54
Chloroethane	ppb v/v	<0.2	<0.2	<0.2	<54
Chloroform	ppb v/v	5.1	0.47	6.3	2200
Chloromethane	ppb v/v	0.94	1.1	0.96	<140
cis-1,2-Dichloroethene	ppb v/v	11	0.64	0.72	3100
cis-1,3-Dichloropropene	ppb v/v	<0.2	<0.2	<0.2	<54
Dibromomethane	ppb v/v	<0.4	<0.4	<0.4	<110
Dichlorodifluoromethane	ppb v/v	0.71	0.67	0.62	<54
Ethylbenzene	ppb v/v	0.15 J	<0.2	0.16 J	<54
Hexachlorobutadiene	ppb v/v	<1	<1	<1	<270
Methylene chloride	ppb v/v	0.35 J,B	0.65	0.71	27 J,B
m-Xylene & p-Xylene	ppb v/v	0.57	<0.2	0.58	<54
o-Xylene	ppb v/v	0.22	<0.2	0.23	<54
Styrene	ppb v/v	<0.2	<0.2	0.071 J	<54
Tetrachloroethene	ppb v/v	2	<0.2	0.29	170
Toluene	ppb v/v	1	0.072 J	1	<54
trans-1,3-Dichloropropene	ppb v/v	<0.5	<0.5	<0.5	<140
Trichloroethene	ppb v/v	120	1.1	3.5	7400
Trichlorofluoromethane	ppb v/v	0.35	0.29	0.27	<54
Vinyl chloride	ppb v/v	0.075 J	<0.2	<0.2	180

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit
Units: ppb v/v: parts per billion volume per volu

TABLE B-9
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location	SVE-A	SVE-B	SVE-C	SVE-D	SVE-D DUP
	Date	8/14/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008
	Units					
1,1,1-Trichloroethane	ppb v/v	<2	<2	<58	<240	<180
1,1,2,2-Tetrachloroethane	ppb v/v	4.4	9.8	20000	14000	11000
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<2	<2	<58	<240	<180
1,1,2-Trichloroethane	ppb v/v	<2	<2	210	<240	<180
1,1-Dichloroethane	ppb v/v	<2	<2	<58	<240	<180
1,1-Dichloroethene	ppb v/v	<2	<2	<58	<240	<180
1,2,4-Trichlorobenzene	ppb v/v	<10	<10	<290	<1200	<920
1,2,4-Trimethylbenzene	ppb v/v	<2	<2	<58	<240	<180
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<2	<2	<58	<240	<180
1,2-Dichlorobenzene	ppb v/v	<2	<2	<58	<240	<180
1,2-Dichloroethane	ppb v/v	<2	<2	37 J	<240	<180
1,2-Dichloropropane	ppb v/v	<2	<2	<58	<240	<180
1,3,5-Trimethylbenzene	ppb v/v	<2	<2	<58	<240	<180
1,3-Dichlorobenzene	ppb v/v	<2	<2	<58	<240	<180
1,4-Dichlorobenzene	ppb v/v	0.69 J	<2	<58	<240	<180
Benzene	ppb v/v	<2	0.57 J	<58	<240	<180
Benzyl chloride	ppb v/v	<4	<4	<120	<490	<370
Bromomethane	ppb v/v	<2	<2	<58	<240	<180
Carbon tetrachloride	ppb v/v	<2	<2	<58	<240	<180
Chlorobenzene	ppb v/v	<2	<2	<58	<240	<180
Chloroethane	ppb v/v	<2	<2	<58	<240	<180
Chloroform	ppb v/v	6.7	1.9 J	160	<240	<180
Chloromethane	ppb v/v	<5	<5	<140	<610	<460
cis-1,2-Dichloroethene	ppb v/v	1.2 J	6	4000	880	580
cis-1,3-Dichloropropene	ppb v/v	<2	<2	<58	<240	<180
Dibromomethane	ppb v/v	<4	<4	<120	<490	<370
Dichlorodifluoromethane	ppb v/v	<2	<2	<58	<240	<180
Ethylbenzene	ppb v/v	<2	<2	<58	<240	<180
Hexachlorobutadiene	ppb v/v	<10	<10	<290	<1200	<920
Methylene chloride	ppb v/v	3.2 J,B	1.5 J,B	31 J,B	210 J,B	730 B
m-Xylene & p-Xylene	ppb v/v	<2	<2	<58	<240	<180
o-Xylene	ppb v/v	<2	<2	<58	<240	<180
Styrene	ppb v/v	<2	<2	<58	<240	<180
Tetrachloroethene	ppb v/v	1.9 J	0.55 J	59	670	600
Toluene	ppb v/v	0.99 J	0.85 J	<58	<240	51 J
trans-1,3-Dichloropropene	ppb v/v	<5	<5	<140	<610	<460
Trichloroethene	ppb v/v	13	24	13000	28000	25000
Trichlorofluoromethane	ppb v/v	0.49 J	<2	<58	<240	61 J
Vinyl chloride	ppb v/v	<2	<2	<58	<240	<180

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-9
ANALYTICAL RESULTS – SVE WELLS AND SYSTEM (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location	SVE-E	SVE-F	SVE-G	SVE-INF
	Date	7/16/2008	7/16/2008	7/16/2008	7/16/2008
	Units				
1,1,1-Trichloroethane	ppb v/v	<2	<2	<5.1	11 J
1,1,2,2-Tetrachloroethane	ppb v/v	7.2	9.4	420	2700
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb v/v	<2	<2	<5.1	24 J
1,1,2-Trichloroethane	ppb v/v	<2	<2	8.9	25 J
1,1-Dichloroethane	ppb v/v	<2	<2	<5.1	<62
1,1-Dichloroethene	ppb v/v	0.42 J	0.37 J	6.4	58 J
1,2,4-Trichlorobenzene	ppb v/v	<10	<10	<26	<310
1,2,4-Trimethylbenzene	ppb v/v	<2	<2	<5.1	<62
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb v/v	<2	<2	<5.1	<62
1,2-Dichlorobenzene	ppb v/v	<2	<2	<5.1	<62
1,2-Dichloroethane	ppb v/v	<2	<2	3.7 J	<62
1,2-Dichloropropane	ppb v/v	<2	<2	4.6 J	<62
1,3,5-Trimethylbenzene	ppb v/v	<2	<2	<5.1	<62
1,3-Dichlorobenzene	ppb v/v	<2	<2	<5.1	<62
1,4-Dichlorobenzene	ppb v/v	<2	<2	<5.1	<62
Benzene	ppb v/v	<2	0.67 J	4.1 J	28 J
Benzyl chloride	ppb v/v	<4	<4	<10	<120
Bromomethane	ppb v/v	<2	<2	<5.1	<62
Carbon tetrachloride	ppb v/v	<2	<2	72	15 J
Chlorobenzene	ppb v/v	<2	<2	<5.1	<62
Chloroethane	ppb v/v	<2	<2	<5.1	<62
Chloroform	ppb v/v	1.6 J	1.6 J	2000	420
Chloromethane	ppb v/v	<5	<5	<13	<160
cis-1,2-Dichloroethene	ppb v/v	5.2	5.7	47	1400
cis-1,3-Dichloropropene	ppb v/v	<2	<2	<5.1	<62
Dibromomethane	ppb v/v	<4	<4	<10	<120
Dichlorodifluoromethane	ppb v/v	<2	<2	2.8 J	<62
Ethylbenzene	ppb v/v	<2	<2	<5.1	<62
Hexachlorobutadiene	ppb v/v	<10	<10	<26	<310
Methylene chloride	ppb v/v	1.4 J,B	1.9 J,B	31 B	77 J,B
m-Xylene & p-Xylene	ppb v/v	<2	<2	<5.1	<62
o-Xylene	ppb v/v	<2	<2	<5.1	<62
Styrene	ppb v/v	<2	<2	<5.1	<62
Tetrachloroethene	ppb v/v	0.49 J	0.46 J	27	140
Toluene	ppb v/v	0.66 J	0.86 J	<5.1	<62
trans-1,3-Dichloropropene	ppb v/v	<5	<5	<13	<160
Trichloroethene	ppb v/v	24	24	600	6800
Trichlorofluoromethane	ppb v/v	<2	0.28 J	<5.1	<62
Vinyl chloride	ppb v/v	<2	<2	3.8 J	97

Notes:
B: Method Blank Contamination
J: Estimate
DUP: Duplicate Sample
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-10
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-01A	VMP-01B	VMP-02A	VMP-02B	VMP-03A
	Date	7/16/2008	7/16/2008	7/16/2008	7/16/2008	7/16/2008
Analyte	Units					
1,1,1-Trichloroethane	ppb(v/v)	<2	<2	15	<5300	<7.3
1,1,2,2-Tetrachloroethane	ppb(v/v)	<2	6.9	<7.8	1900 J	15
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	1 J	<2	1100	<5300	<7.3
1,1,2-Trichloroethane	ppb(v/v)	<2	2.2	<7.8	1600 J	<7.3
1,1-Dichloroethane	ppb(v/v)	<2	<2	7.1 J	<5300	<7.3
1,1-Dichloroethene	ppb(v/v)	1.9 J	1.1 J	95	18000	<7.3
1,2,4-Trichlorobenzene	ppb(v/v)	<10	<10	<39	<27000	<36
1,2,4-Trimethylbenzene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
1,2-Dichlorobenzene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
1,2-Dichloroethane	ppb(v/v)	<2	0.77 J	<7.8	<5300	<7.3
1,2-Dichloropropane	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
1,3,5-Trimethylbenzene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
1,3-Dichlorobenzene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
1,4-Dichlorobenzene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
Benzene	ppb(v/v)	<2	3.2	<7.8	4400 J	<7.3
Benzyl chloride	ppb(v/v)	<4	<4	<16	<11000	<15
Bromomethane	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
Carbon tetrachloride	ppb(v/v)	<2	<2	<7.8	<5300	1.6 J
Chlorobenzene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
Chloroethane	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
Chloroform	ppb(v/v)	15	7.1	<7.8	1500 J	5.8 J
Chloromethane	ppb(v/v)	<5	<5	<20	<13000	<18
cis-1,2-Dichloroethene	ppb(v/v)	1.2 J	60	33	910000	96
cis-1,3-Dichloropropene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
Dibromomethane	ppb(v/v)	<4	<4	<16	<11000	<15
Dichlorodifluoromethane	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
Ethylbenzene	ppb(v/v)	<2	1.1 J	<7.8	<5300	<7.3
Hexachlorobutadiene	ppb(v/v)	<10	<10	<39	<27000	<36
Methylene chloride	ppb(v/v)	2 J,B	2.9 J,B	8.1 J,B	3600 J,B	6.2 J,B
m-Xylene & p-Xylene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
o-Xylene	ppb(v/v)	<2	<2	<7.8	<5300	<7.3
Styrene	ppb(v/v)	<2	1.2 J	<7.8	<5300	<7.3
Tetrachloroethene	ppb(v/v)	3	58	1.7 J	2000 J	9.1
Toluene	ppb(v/v)	<2	1.9 J	<7.8	<5300	<7.3
trans-1,3-Dichloropropene	ppb(v/v)	<5	<5	<20	<13000	<18
Trichloroethene	ppb(v/v)	4.3	44	40	330000	1200
Trichlorofluoromethane	ppb(v/v)	0.27 J	0.28 J	20	<5300	<7.3
Vinyl chloride	ppb(v/v)	<2	<2	9.6	400000	3.1 J

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-10
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-03B	VMP-04A	VMP-04B	VMP-05A	DUP
	Date	7/16/2008	7/16/2008	7/16/2008	7/17/2008	7/17/2008
Analyte	Units					
1,1,1-Trichloroethane	ppb(v/v)	<3400	<2	<12	<2	<2
1,1,2,2-Tetrachloroethane	ppb(v/v)	<3400	7.8	<12	97	130
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	<3400	<2	<12	<2	<2
1,1,2-Trichloroethane	ppb(v/v)	<3400	<2	4.2 J	<2	<2
1,1-Dichloroethane	ppb(v/v)	<3400	<2	<12	<2	<2
1,1-Dichloroethene	ppb(v/v)	3000 J	<2	7.3 J	<2	<2
1,2,4-Trichlorobenzene	ppb(v/v)	<17000	<10	<58	<10	<10
1,2,4-Trimethylbenzene	ppb(v/v)	<3400	<2	<12	<2	<2
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<3400	<2	<12	<2	<2
1,2-Dichlorobenzene	ppb(v/v)	<3400	<2	<12	<2	<2
1,2-Dichloroethane	ppb(v/v)	<3400	<2	<12	<2	<2
1,2-Dichloropropane	ppb(v/v)	<3400	<2	<12	<2	<2
1,3,5-Trimethylbenzene	ppb(v/v)	<3400	<2	<12	<2	<2
1,3-Dichlorobenzene	ppb(v/v)	<3400	<2	<12	<2	<2
1,4-Dichlorobenzene	ppb(v/v)	<3400	<2	<12	<2	<2
Benzene	ppb(v/v)	1100 J	<2	21	0.68 J	0.78 J
Benzyl chloride	ppb(v/v)	<6700	<4	<23	<4	<4
Bromomethane	ppb(v/v)	<3400	<2	<12	<2	<2
Carbon tetrachloride	ppb(v/v)	<3400	<2	<12	<2	<2
Chlorobenzene	ppb(v/v)	<3400	<2	<12	<2	<2
Chloroethane	ppb(v/v)	<3400	<2	<12	<2	<2
Chloroform	ppb(v/v)	7000	58	38	0.85 J	0.83 J
Chloromethane	ppb(v/v)	<8400	<5	<29	<5	<5
cis-1,2-Dichloroethene	ppb(v/v)	1600000	140	2000	5.4	6
cis-1,3-Dichloropropene	ppb(v/v)	<3400	<2	<12	<2	<2
Dibromomethane	ppb(v/v)	<6700	<4	<23	<4	<4
Dichlorodifluoromethane	ppb(v/v)	<3400	<2	<12	<2	0.7 J
Ethylbenzene	ppb(v/v)	<3400	<2	<12	<2	<2
Hexachlorobutadiene	ppb(v/v)	<17000	<10	<58	<10	<10
Methylene chloride	ppb(v/v)	2500 J,B	2.5 J,B	12 J,B	2.7 J,B	2.2 J,B
m-Xylene & p-Xylene	ppb(v/v)	<3400	<2	<12	<2	<2
o-Xylene	ppb(v/v)	<3400	<2	<12	<2	<2
Styrene	ppb(v/v)	<3400	<2	<12	<2	<2
Tetrachloroethene	ppb(v/v)	50000	2.6	81	1.9 J	1.9 J
Toluene	ppb(v/v)	<3400	<2	13	1.1 J	0.85 J
trans-1,3-Dichloropropene	ppb(v/v)	<8400	<5	<29	<5	<5
Trichloroethene	ppb(v/v)	5800000	85	710	200	220
Trichlorofluoromethane	ppb(v/v)	<3400	0.27 J	<12	0.36 J	0.39 J
Vinyl chloride	ppb(v/v)	<3400	<2	<12	<2	<2

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-10
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-05B	VMP-06A	VMP-06B	DUP	VMP-07A
	Date	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008
Analyte	Units					
1,1,1-Trichloroethane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,1,2,2-Tetrachloroethane	ppb(v/v)	970 J	680	4800000	1500000	9.5
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,1,2-Trichloroethane	ppb(v/v)	<2200	2.6 J	4000	<16000	0.82 J
1,1-Dichloroethane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,1-Dichloroethene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,2,4-Trichlorobenzene	ppb(v/v)	<11000	<22	<11000	<79000	<10
1,2,4-Trimethylbenzene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,2-Dichlorobenzene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,2-Dichloroethane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,2-Dichloropropane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,3,5-Trimethylbenzene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,3-Dichlorobenzene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
1,4-Dichlorobenzene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Benzene	ppb(v/v)	2000 J	<4.4	<2300	<16000	1.8 J
Benzyl chloride	ppb(v/v)	<4400	<8.9	<4500	<32000	<4
Bromomethane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Carbon tetrachloride	ppb(v/v)	<2200	<4.4	<2300	<16000	1.5 J
Chlorobenzene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Chloroethane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Chloroform	ppb(v/v)	670 J	1.6 J	<2300	<16000	38
Chloromethane	ppb(v/v)	<5500	<11	<5700	<40000	<5
cis-1,2-Dichloroethene	ppb(v/v)	11000	14	23000	19000 J	18
cis-1,3-Dichloropropene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Dibromomethane	ppb(v/v)	<4400	<8.9	<4500	<32000	<4
Dichlorodifluoromethane	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Ethylbenzene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Hexachlorobutadiene	ppb(v/v)	<11000	<22	<11000	<79000	<10
Methylene chloride	ppb(v/v)	1900 J,B	2.3 J,B	1400 J,B	6600 J,B	1.4 J,B
m-Xylene & p-Xylene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
o-Xylene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Styrene	ppb(v/v)	<2200	<4.4	<2300	<16000	<2
Tetrachloroethene	ppb(v/v)	16000	0.99 J	31000	23000	0.6 J
Toluene	ppb(v/v)	3900	<4.4	<2300	<16000	<2
trans-1,3-Dichloropropene	ppb(v/v)	<5500	<11	<5700	<40000	<5
Trichloroethene	ppb(v/v)	540000	540	3500000	2100000	16
Trichlorofluoromethane	ppb(v/v)	<2200	<4.4	<2300	<16000	0.25 J
Vinyl chloride	ppb(v/v)	<2200	<4.4	<2300	<16000	<2

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-10
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-07B	VMP-08A	VMP-08B	VMP-09A	VMP-09B
	Date	7/17/2008	7/17/2008	7/17/2008	7/17/2008	7/17/2008
Analyte	Units					
1,1,1-Trichloroethane	ppb(v/v)	<9.7	<2	<50	1.4 J	0.86 J
1,1,2,2-Tetrachloroethane	ppb(v/v)	32	3.2	2300	5.9 J	6.4
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
1,1,2-Trichloroethane	ppb(v/v)	8.5 J	<2	150	<7.9	<3.6
1,1-Dichloroethane	ppb(v/v)	<9.7	<2	18 J	<7.9	<3.6
1,1-Dichloroethene	ppb(v/v)	7.3 J	1.6 J	22 J	99	60
1,2,4-Trichlorobenzene	ppb(v/v)	<49	<10	<250	<39	<18
1,2,4-Trimethylbenzene	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
1,2-Dichlorobenzene	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
1,2-Dichloroethane	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
1,2-Dichloropropane	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
1,3,5-Trimethylbenzene	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
1,3-Dichlorobenzene	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
1,4-Dichlorobenzene	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
Benzene	ppb(v/v)	20	<2	17 J	2.6 J	110
Benzyl chloride	ppb(v/v)	<19	<4	<100	<16	<7.3
Bromomethane	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
Carbon tetrachloride	ppb(v/v)	410	1.6 J	24 J	750	450
Chlorobenzene	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
Chloroethane	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
Chloroform	ppb(v/v)	350	0.94 J	350	1100	480
Chloromethane	ppb(v/v)	<24	<5	<120	<20	<9.1
cis-1,2-Dichloroethene	ppb(v/v)	770	1.6 J	2500	25	9.3
cis-1,3-Dichloropropene	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
Dibromomethane	ppb(v/v)	<19	<4	<100	<16	<7.3
Dichlorodifluoromethane	ppb(v/v)	<9.7	1.6 J	<50	46	37
Ethylbenzene	ppb(v/v)	<9.7	<2	<50	<7.9	20
Hexachlorobutadiene	ppb(v/v)	<49	<10	<250	<39	<18
Methylene chloride	ppb(v/v)	7.8 J,B	1.9 J,B	22 J,B	4 J,B	3.5 J,B
m-Xylene & p-Xylene	ppb(v/v)	<9.7	<2	<50	<7.9	3.4 J
o-Xylene	ppb(v/v)	<9.7	<2	<50	<7.9	1.7 J
Styrene	ppb(v/v)	<9.7	<2	<50	<7.9	<3.6
Tetrachloroethene	ppb(v/v)	56	3.3	180	190	110
Toluene	ppb(v/v)	3 J	<2	<50	<7.9	28
trans-1,3-Dichloropropene	ppb(v/v)	<24	<5	<120	<20	<9.1
Trichloroethene	ppb(v/v)	1900	5.2	11000	2400	1000
Trichlorofluoromethane	ppb(v/v)	<9.7	0.51 J	<50	3.2 J	2.3 J
Vinyl chloride	ppb(v/v)	23	<2	92	<7.9	<3.6

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-10
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (3Q08 EVENT)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

	Location	VMP-10A	VMP-10B
	Date	7/17/2008	7/17/2008
Analyte	Units		
1,1,1-Trichloroethane	ppb(v/v)	<2	<63
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.92 J	5400
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	1.4 J	<63
1,1,2-Trichloroethane	ppb(v/v)	<2	700
1,1-Dichloroethane	ppb(v/v)	<2	<63
1,1-Dichloroethene	ppb(v/v)	2.9	<63
1,2,4-Trichlorobenzene	ppb(v/v)	<10	<310
1,2,4-Trimethylbenzene	ppb(v/v)	<2	<63
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<2	<63
1,2-Dichlorobenzene	ppb(v/v)	<2	<63
1,2-Dichloroethane	ppb(v/v)	<2	<63
1,2-Dichloropropane	ppb(v/v)	<2	<63
1,3,5-Trimethylbenzene	ppb(v/v)	<2	<63
1,3-Dichlorobenzene	ppb(v/v)	<2	<63
1,4-Dichlorobenzene	ppb(v/v)	<2	<63
Benzene	ppb(v/v)	<2	<63
Benzyl chloride	ppb(v/v)	<4	<130
Bromomethane	ppb(v/v)	<2	<63
Carbon tetrachloride	ppb(v/v)	67	18 J
Chlorobenzene	ppb(v/v)	<2	<63
Chloroethane	ppb(v/v)	<2	<63
Chloroform	ppb(v/v)	5.9	260
Chloromethane	ppb(v/v)	<5	<160
cis-1,2-Dichloroethene	ppb(v/v)	<3	<94
cis-1,3-Dichloropropene	ppb(v/v)	<2	<63
Dibromomethane	ppb(v/v)	<4	<130
Dichlorodifluoromethane	ppb(v/v)	<2	<63
Ethylbenzene	ppb(v/v)	<2	<63
Hexachlorobutadiene	ppb(v/v)	<10	<310
Methylene chloride	ppb(v/v)	1.8 J,B	67 J,B
m-Xylene & p-Xylene	ppb(v/v)	<2	<63
o-Xylene	ppb(v/v)	<2	<63
Styrene	ppb(v/v)	<2	<63
Tetrachloroethene	ppb(v/v)	4.7	23 J
Toluene	ppb(v/v)	<2	<63
trans-1,3-Dichloropropene	ppb(v/v)	<5	<160
Trichloroethene	ppb(v/v)	2.7	530
Trichlorofluoromethane	ppb(v/v)	0.33 J	<63
Vinyl chloride	ppb(v/v)	<2	<63

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-11
ANALYTICAL RESULTS – SVE WELLS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location / Date / Units	SVE-B 4/3/2008	SVE-E 4/3/2008	SVE-F 4/3/2008	SVE-B 4/18/2008
1,1,1-Trichloroethane	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
1,1,2,2-Tetrachloroethane	ppb(v/v)	2.3	0.82	2.4	1.9
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	0.21	0.19 J	0.22	0.17 J
1,1,2-Trichloroethane	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethene	ppb(v/v)	0.07 J	0.058 J	0.064 J	0.043 J
1,2,4-Trichlorobenzene	ppb(v/v)	<1 J	<1 J	<1 J	<1
1,2,4-Trimethylbenzene	ppb(v/v)	0.13 J	0.079 J	0.5	0.21
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
1,2-Dichloroethane	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
1,2-Dichloropropane	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
1,3,5-Trimethylbenzene	ppb(v/v)	<0.2	<0.2	0.25	<0.2
1,3-Dichlorobenzene	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
1,4-Dichlorobenzene	ppb(v/v)	<0.2	<0.2	0.09 J	0.099 J
Benzene	ppb(v/v)	0.49	0.46	0.57	0.42
Benzyl chloride	ppb(v/v)	<0.4	<0.4	<0.4	<0.4
Bromomethane	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
Carbon tetrachloride	ppb(v/v)	0.25	0.19 J	0.24	0.15 J
Chlorobenzene	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
Chloroethane	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
Chloroform	ppb(v/v)	0.75	0.55	1.1	0.6
Chloromethane	ppb(v/v)	0.81	0.9	0.85	0.82
cis-1,2-Dichloroethene	ppb(v/v)	6.4	1.6	2.1	2.7
cis-1,3-Dichloropropene	ppb(v/v)	<0.2	<0.2	<0.2	<0.2
Dibromomethane	ppb(v/v)	<0.4	<0.4	<0.4	<0.4
Dichlorodifluoromethane	ppb(v/v)	0.62	0.57	0.6	0.64
Ethylbenzene	ppb(v/v)	0.098 J	0.25	0.85	0.19 J
Hexachlorobutadiene	ppb(v/v)	<1	<1	<1	<1
Methylene chloride	ppb(v/v)	0.26 J	0.26 J	0.38 J	0.27 J,B
m-Xylene & p-Xylene	ppb(v/v)	0.34	0.71	3.4	0.5
o-Xylene	ppb(v/v)	0.14 J	0.24	1.1	0.19 J
Styrene	ppb(v/v)	<0.2	<0.2	0.18 J	0.1 J
Tetrachloroethene	ppb(v/v)	0.19 J	0.12 J	0.18 J	0.12 J
Toluene	ppb(v/v)	2.6	3	5.4	0.84
trans-1,3-Dichloropropene	ppb(v/v)	<0.5	<0.5	<0.5	<0.5
Trichloroethene	ppb(v/v)	7.8	3.4	4.8	5.6
Trichlorofluoromethane	ppb(v/v)	0.32	0.31	0.33	0.31
Vinyl chloride	ppb(v/v)	0.47	0.29	0.35	0.21

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-11
ANALYTICAL RESULTS – SVE WELLS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location Date Units	SVE-B DUP 4/18/2008	SVE-E 4/18/2008	SVE-F 4/18/2008
1,1,1-Trichloroethane	ppb(v/v)	<0.2	<0.2	<0.2
1,1,2,2-Tetrachloroethane	ppb(v/v)	0.68	0.47	0.53
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	0.22	0.19 J	0.2
1,1,2-Trichloroethane	ppb(v/v)	<0.2	<0.2	<0.2
1,1-Dichloroethane	ppb(v/v)	<0.2	<0.2	<0.2
1,1-Dichloroethene	ppb(v/v)	<0.2	0.055 J	0.049 J
1,2,4-Trichlorobenzene	ppb(v/v)	<1	<1	<1
1,2,4-Trimethylbenzene	ppb(v/v)	0.1 J	0.14 J	0.15 J
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<0.2	<0.2	0.033 J
1,2-Dichlorobenzene	ppb(v/v)	<0.2	<0.2	<0.2
1,2-Dichloroethane	ppb(v/v)	<0.2	<0.2	<0.2
1,2-Dichloropropane	ppb(v/v)	<0.2	<0.2	<0.2
1,3,5-Trimethylbenzene	ppb(v/v)	<0.2	<0.2	<0.2
1,3-Dichlorobenzene	ppb(v/v)	<0.2	<0.2	<0.2
1,4-Dichlorobenzene	ppb(v/v)	<0.2	<0.2	<0.2
Benzene	ppb(v/v)	0.31	0.42	0.41
Benzyl chloride	ppb(v/v)	<0.4	<0.4	<0.4
Bromomethane	ppb(v/v)	<0.2	<0.2	<0.2
Carbon tetrachloride	ppb(v/v)	0.2	0.2	0.19 J
Chlorobenzene	ppb(v/v)	<0.2	<0.2	<0.2
Chloroethane	ppb(v/v)	<0.2	<0.2	<0.2
Chloroform	ppb(v/v)	0.84	0.65	0.71
Chloromethane	ppb(v/v)	0.91	1.1	0.91
cis-1,2-Dichloroethene	ppb(v/v)	2.7	1.8	2.1
cis-1,3-Dichloropropene	ppb(v/v)	<0.2	<0.2	<0.2
Dibromomethane	ppb(v/v)	<0.4	<0.4	<0.4
Dichlorodifluoromethane	ppb(v/v)	0.67	0.68	0.69
Ethylbenzene	ppb(v/v)	<0.2	0.091 J	0.12 J
Hexachlorobutadiene	ppb(v/v)	<1	<1	<1
Methylene chloride	ppb(v/v)	0.3 J,B	0.47 J,B	0.31 J,B
m-Xylene & p-Xylene	ppb(v/v)	0.2	0.32	0.33
o-Xylene	ppb(v/v)	0.082 J	0.13 J	0.14 J
Styrene	ppb(v/v)	<0.2	<0.2	<0.2
Tetrachloroethene	ppb(v/v)	0.12 J	0.089 J	0.12 J
Toluene	ppb(v/v)	0.54	0.69	0.71
trans-1,3-Dichloropropene	ppb(v/v)	<0.5	<0.5	<0.5
Trichloroethene	ppb(v/v)	6.5	4.8	5.2
Trichlorofluoromethane	ppb(v/v)	0.33	0.36	0.35
Vinyl chloride	ppb(v/v)	0.28	0.25	0.24

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-12
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location / Date / Units	VMP-02A 4/3/2008	VMP-02B 4/3/2008	VMP-06A 4/3/2008	VMP-06B 4/3/2008
1,1,1-Trichloroethane	ppb(v/v)	<2	<570	<3.7	<810
1,1,2,2-Tetrachloroethane	ppb(v/v)	1.8 J	280 J	460	300000
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	110	<570	<3.7	<810
1,1,2-Trichloroethane	ppb(v/v)	<2	<570	1.3 J	490 J
1,1-Dichloroethane	ppb(v/v)	<2	<570	<3.7	<810
1,1-Dichloroethene	ppb(v/v)	1.8 J	3700	<3.7	<810
1,2,4-Trichlorobenzene	ppb(v/v)	<10	<2900	<18 J	<4100
1,2,4-Trimethylbenzene	ppb(v/v)	<2	<570	<3.7	<810
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<2	<570	<3.7	<810
1,2-Dichlorobenzene	ppb(v/v)	<2	<570	<3.7	<810
1,2-Dichloroethane	ppb(v/v)	<2	<570	<3.7	<810
1,2-Dichloropropane	ppb(v/v)	<2	<570	1 J	<810
1,3,5-Trimethylbenzene	ppb(v/v)	<2	<570	<3.7	<810
1,3-Dichlorobenzene	ppb(v/v)	<2	<570	<3.7	<810
1,4-Dichlorobenzene	ppb(v/v)	<2	<570	<3.7	<810
Benzene	ppb(v/v)	<2	<570	<3.7	<810
Benzyl chloride	ppb(v/v)	<4	<1100	<7.3	<1600
Bromomethane	ppb(v/v)	<2	<570	<3.7	<810
Carbon tetrachloride	ppb(v/v)	<2	<570	19	<810
Chlorobenzene	ppb(v/v)	<2	<570	<3.7	<810
Chloroethane	ppb(v/v)	<2	<570	<3.7	<810
Chloroform	ppb(v/v)	1.2 J	220 J	65	<810
Chloromethane	ppb(v/v)	<5	<1400	<9.2	<2000
cis-1,2-Dichloroethene	ppb(v/v)	96	94000	14	3900
cis-1,3-Dichloropropene	ppb(v/v)	<2	<570	<3.7	<810
Dibromomethane	ppb(v/v)	<4	<1100	<7.3	<1600
Dichlorodifluoromethane	ppb(v/v)	0.95 J	<570	<3.7	<810
Ethylbenzene	ppb(v/v)	<2	<570	<3.7	<810
Hexachlorobutadiene	ppb(v/v)	<10	<2900	<18	<4100
Methylene chloride	ppb(v/v)	1.1 J,B	290 J,B	10	410 J,B
m-Xylene & p-Xylene	ppb(v/v)	<2	<570	<3.7	<810
o-Xylene	ppb(v/v)	<2	<570	<3.7	<810
Styrene	ppb(v/v)	<2	<570	<3.7	<810
Tetrachloroethene	ppb(v/v)	1.3 J	<570	2 J	6400
Toluene	ppb(v/v)	<2	<570	<3.7	<810
trans-1,3-Dichloropropene	ppb(v/v)	<5	<1400	<9.2	<2000
Trichloroethene	ppb(v/v)	170 B	9500 B	170	260000 B
Trichlorofluoromethane	ppb(v/v)	9.9	<570	0.52 J	<810
Vinyl chloride	ppb(v/v)	<2	21000	<3.7	<810

Notes:
B: Method Blank Contamination
J: Estimate
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Units: ppb v/v: parts per billion volume per volume

TABLE B-12
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location / Date / Units	VMP-07A 4/3/2008	VMP-07B 4/3/2008	VMP-08A 4/3/2008	VMP-08B 4/3/2008
1,1,1-Trichloroethane	ppb(v/v)	<2	<4.8	<0.5	<31
1,1,2,2-Tetrachloroethane	ppb(v/v)	5	120	16	750
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	<2	<4.8	<0.5	<31
1,1,2-Trichloroethane	ppb(v/v)	0.64 J	1.3 J	0.36 J	40
1,1-Dichloroethane	ppb(v/v)	<2	<4.8	<0.5	5.6 J
1,1-Dichloroethene	ppb(v/v)	0.46 J	5.3	0.17 J	13 J
1,2,4-Trichlorobenzene	ppb(v/v)	<10	<24	<2.5 J	<150
1,2,4-Trimethylbenzene	ppb(v/v)	<2	<4.8	<0.5	<31
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<2	<4.8	<0.5	<31
1,2-Dichlorobenzene	ppb(v/v)	<2	<4.8	<0.5	<31
1,2-Dichloroethane	ppb(v/v)	<2	<4.8	<0.5	<31
1,2-Dichloropropane	ppb(v/v)	<2	<4.8	<0.5	<31
1,3,5-Trimethylbenzene	ppb(v/v)	<2	<4.8	<0.5	<31
1,3-Dichlorobenzene	ppb(v/v)	<2	<4.8	<0.5	<31
1,4-Dichlorobenzene	ppb(v/v)	<2	<4.8	0.19 J	<31
Benzene	ppb(v/v)	<2	2 J	0.29 J	<31
Benzyl chloride	ppb(v/v)	<4	<9.6	<1	<61
Bromomethane	ppb(v/v)	<2	<4.8	<0.5	<31
Carbon tetrachloride	ppb(v/v)	210	86	120	26 J
Chlorobenzene	ppb(v/v)	<2	<4.8	<0.5	<31
Chloroethane	ppb(v/v)	<2	<4.8	<0.5	<31
Chloroform	ppb(v/v)	96	48	3.3	89
Chloromethane	ppb(v/v)	<5	<12	<1.2	<77
cis-1,2-Dichloroethene	ppb(v/v)	33	130	1.4	670
cis-1,3-Dichloropropene	ppb(v/v)	<2	<4.8	<0.5	<31
Dibromomethane	ppb(v/v)	<4	<9.6	<1	<61
Dichlorodifluoromethane	ppb(v/v)	0.92 J	<4.8	0.22 J	<31
Ethylbenzene	ppb(v/v)	<2	<4.8	<0.5	<31
Hexachlorobutadiene	ppb(v/v)	<10	<24	<2.5	<150
Methylene chloride	ppb(v/v)	5.2 B	2.8 J,B	0.62 J	15 J,B
m-Xylene & p-Xylene	ppb(v/v)	<2	<4.8	0.32 J	<31
o-Xylene	ppb(v/v)	<2	<4.8	<0.5	<31
Styrene	ppb(v/v)	<2	<4.8	<0.5	<31
Tetrachloroethene	ppb(v/v)	38	20	16	56
Toluene	ppb(v/v)	<2	<4.8	0.63	<31
trans-1,3-Dichloropropene	ppb(v/v)	<5	<12	<1.2	<77
Trichloroethene	ppb(v/v)	100 B	520 B	10	3400 B
Trichlorofluoromethane	ppb(v/v)	0.4 J	<4.8	0.31 J	<31
Vinyl chloride	ppb(v/v)	<2	66	<0.5	31

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-12
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location / Date / Units	VMP-02A 4/17/2008	VMP-02B 4/17/2008	VMP-06A 4/17/2008	VMP-06B 4/17/2008
1,1,1-Trichloroethane	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,1,2,2-Tetrachloroethane	ppb(v/v)	1.4	1900	120	160000
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	93	<1200	<0.67	<1200
1,1,2-Trichloroethane	ppb(v/v)	0.49 J	<1200	0.8	<1200
1,1-Dichloroethane	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,1-Dichloroethene	ppb(v/v)	1.7	4100	0.24 J	<1200
1,2,4-Trichlorobenzene	ppb(v/v)	<6.7	<6100	<3.3	<6000
1,2,4-Trimethylbenzene	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,2-Dichlorobenzene	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,2-Dichloroethane	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,2-Dichloropropane	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,3,5-Trimethylbenzene	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,3-Dichlorobenzene	ppb(v/v)	<1.3	<1200	<0.67	<1200
1,4-Dichlorobenzene	ppb(v/v)	<1.3	<1200	<0.67	<1200
Benzene	ppb(v/v)	<1.3	<1200	0.25 J	<1200
Benzyl chloride	ppb(v/v)	<2.7	<2400	<1.3	<2400
Bromomethane	ppb(v/v)	<1.3	<1200	<0.67	<1200
Carbon tetrachloride	ppb(v/v)	0.28 J	<1200	39	<1200
Chlorobenzene	ppb(v/v)	<1.3	<1200	<0.67	<1200
Chloroethane	ppb(v/v)	<1.3	<1200	<0.67	<1200
Chloroform	ppb(v/v)	1.5	380 J	99	<1200
Chloromethane	ppb(v/v)	<3.3	<3000	<1.7	<3000
cis-1,2-Dichloroethene	ppb(v/v)	100	140000	20	2000
cis-1,3-Dichloropropene	ppb(v/v)	<1.3	<1200	<0.67	<1200
Dibromomethane	ppb(v/v)	<2.7	<2400	<1.3	<2400
Dichlorodifluoromethane	ppb(v/v)	0.91 J	<1200	0.6 J	<1200
Ethylbenzene	ppb(v/v)	<1.3	<1200	<0.67	<1200
Hexachlorobutadiene	ppb(v/v)	<6.7	<6100	<3.3	<6000
Methylene chloride	ppb(v/v)	0.73 J,B	810 J,B	0.45 J,B	860 J,B
m-Xylene & p-Xylene	ppb(v/v)	<1.3	<1200	<0.67	<1200
o-Xylene	ppb(v/v)	<1.3	<1200	<0.67	<1200
Styrene	ppb(v/v)	<1.3	<1200	<0.67	<1200
Tetrachloroethene	ppb(v/v)	1.4	<1200	3.4	2700
Toluene	ppb(v/v)	<1.3	<1200	<0.67	<1200
trans-1,3-Dichloropropene	ppb(v/v)	<3.3	<3000	<1.7	<3000
Trichloroethene	ppb(v/v)	180	39000	170	150000
Trichlorofluoromethane	ppb(v/v)	9	<1200	0.4 J	<1200
Vinyl chloride	ppb(v/v)	<1.3	18000	<0.67	<1200

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

TABLE B-12
ANALYTICAL RESULTS – VAPOR MONITORING POINTS (REBOUND EVENTS 1A AND 1B)
ANNUAL OPERATIONS REPORT - 2007/8
FLUVIAL SVE SYSTEM – YEAR ONE
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Location / Date / Units	VMP-07A 4/17/2008	VMP-07B 4/17/2008	VMP-08A 4/17/2008	VMP-08B 4/17/2008
1,1,1-Trichloroethane	ppb(v/v)	<0.44	<1.9	0.053 J	<42
1,1,2,2-Tetrachloroethane	ppb(v/v)	12	62	25	730
1,1,2-Trichloro-1,2,2-trifluoroethane	ppb(v/v)	0.11 J	<1.9	0.1 J	<42
1,1,2-Trichloroethane	ppb(v/v)	0.9	1.5 J	0.59	53
1,1-Dichloroethane	ppb(v/v)	0.13 J	<1.9	0.075 J	7.2 J
1,1-Dichloroethene	ppb(v/v)	0.33 J	6.4	0.13 J	16 J
1,2,4-Trichlorobenzene	ppb(v/v)	<2.2	<9.6	<1	<210
1,2,4-Trimethylbenzene	ppb(v/v)	<0.44	1.5 J	<0.2	<42
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ppb(v/v)	<0.44	<1.9	0.034 J	<42
1,2-Dichlorobenzene	ppb(v/v)	<0.44	<1.9	<0.2	<42
1,2-Dichloroethane	ppb(v/v)	0.38 J	<1.9	0.15 J	<42
1,2-Dichloropropane	ppb(v/v)	<0.44	<1.9	<0.2	<42
1,3,5-Trimethylbenzene	ppb(v/v)	<0.44	<1.9	<0.2	<42
1,3-Dichlorobenzene	ppb(v/v)	<0.44	<1.9	<0.2	<42
1,4-Dichlorobenzene	ppb(v/v)	<0.44	<1.9	0.11 J	<42
Benzene	ppb(v/v)	1.3	4.7	0.31	<42
Benzyl chloride	ppb(v/v)	<0.88	<3.9	<0.4	<83
Bromomethane	ppb(v/v)	<0.44	<1.9	<0.2	<42
Carbon tetrachloride	ppb(v/v)	170	360	170	27 J
Chlorobenzene	ppb(v/v)	<0.44	<1.9	<0.2	<42
Chloroethane	ppb(v/v)	<0.44	<1.9	0.049 J	<42
Chloroform	ppb(v/v)	180	86	6.5	120
Chloromethane	ppb(v/v)	<1.1	<4.8	0.34 J	<100
cis-1,2-Dichloroethene	ppb(v/v)	11	540	2.1	820
cis-1,3-Dichloropropene	ppb(v/v)	<0.44	<1.9	<0.2	<42
Dibromomethane	ppb(v/v)	<0.88	<3.9	<0.4	<83
Dichlorodifluoromethane	ppb(v/v)	0.83	0.66 J	1	<42
Ethylbenzene	ppb(v/v)	<0.44	<1.9	<0.2	<42
Hexachlorobutadiene	ppb(v/v)	<2.2	<9.6	<1	<210
Methylene chloride	ppb(v/v)	0.85 J,B	2.1 J,B	0.26 J,B	25 J,B
m-Xylene & p-Xylene	ppb(v/v)	<0.44	<1.9	<0.2	<42
o-Xylene	ppb(v/v)	<0.44	<1.9	<0.2	<42
Styrene	ppb(v/v)	<0.44	<1.9	0.071 J	<42
Tetrachloroethene	ppb(v/v)	60	45	32	81
Toluene	ppb(v/v)	0.2 J	<1.9	0.21	<42
trans-1,3-Dichloropropene	ppb(v/v)	<1.1	<4.8	<0.5	<100
Trichloroethene	ppb(v/v)	64	1000	16	5000
Trichlorofluoromethane	ppb(v/v)	0.35 J	0.56 J	0.51	<42
Vinyl chloride	ppb(v/v)	0.17 J	98	<0.2	44

Notes:
B: Method Blank Contamination
J: Estimate
<: Result is less than laboratory detection limit.
Units: ppb v/v: parts per billion volume per volume

APPENDIX C

DATA QUALITY EVALUATION

DATA QUALITY EVALUATION

System monitoring for the Fluvial Soil Vapor Extraction (SVE) System at Dunn Field included sampling and analysis of vapor samples from the treatment system, SVE wells and vapor monitoring points. The sampling activities conducted during baseline and quarterly sampling events and during a rebound test were performed in general accordance with the field and laboratory procedures specified in the *Remedial Action Sampling and Analysis Plan, Revisions 0 and 1* (RA SAP) (MACTEC, 2005). Vapor samples were submitted to TestAmerica Laboratory in Knoxville, Tennessee for analysis

The data quality evaluation (DQE) process involves assessment of field and laboratory procedures, including independent data validation completed by Diane Short and Associates, Inc (DSA) in accordance with the RA SAP. The data validation forms are included in this appendix. This assessment is designed to evaluate the quality assurance (QA)/quality control (QC) associated with the laboratory data and potential impact to the data quality objectives (DQOs). The DQE findings are summarized in the following sections.

FIELD ACTIVITIES AND FIELD QUALITY CONTROL

The field effort included the collection of vapor samples using 6-Liter (L) Summa canisters at SVE wells, VMPs, and system influent and effluent. These canisters were equipped with regulators pre-set at 200milliliters per minute (mL/min). Field duplicate samples were also collected at a rate of about 10% to evaluate sampling technique. Documentation of the sampling was performed in the field to ensure that the sample collected, labeling, chain-of-custody, and request for analysis were in agreement. Summa canisters met EPA requirements for environmentally clean containers. Custody seals were placed on each cooler before shipment by common carrier.

ANALYTICAL METHODS

The vapor samples were analyzed for volatile organic compounds (VOCs) by EPA method TO-15.

LABORATORY QUALITY CONTROL

The laboratory QC program, including sample handling, laboratory control, and reporting, is documented in the RA SAP. Sample handling includes documentation of sample receipt, placement in storage, laboratory personnel using the sample, and disposal. The laboratory control consists of instrument calibration and maintenance, laboratory control samples (LCS) or Laboratory Control Duplicates, method blanks and laboratory duplicates. Reporting of the laboratory control data was planned prior to the

collection of the data, allowing the laboratory to place the appropriate information into the data package so that the DQE could be completed in a timely manner.

DATA QUALITY EVALUATION

The objective of the DQE was to provide a review of the chemical data reports submitted by the laboratory and to assess the data in relation to the DQOs stated in the RA SAP. The DQE consisted of review of laboratory QC data and field QC parameters, and flagging of the data as usable, usable with qualification, or unusable following the DQE standard operating procedures (SOPs) using the criteria stated in the RA SAP for each analytical method performed. The following information was reviewed:

- Sample Integrity (Deliverables)
- Sample Completeness
- Sample Holding Times
- Laboratory Methods for Extraction and Analysis (Calibration)
- Method Accuracy and Precision (Surrogates, Laboratory Control Duplicate Recoveries)
- Laboratory Performance Criteria (Method Blanks)

Field QC parameters were evaluated through field duplicates, field documentation, and shipping criteria. The DQE was summarized by use of flags that indicate to the reviewer that the data being considered has been qualified using the established criteria. Sample delivery group (SDG) narratives detailing the evaluation of the laboratory data by DSA are included as attachments to this appendix. The SDGs and associated air samples are listed on Table C-1.

The following sections provide summary discussions of the required data qualifications for each sampling event. A Level III DQE was performed and the data quality indicators (DQIs) included sample integrity, holding times, trip blanks, field blanks, method blanks, internal standards, calibrations, surrogate recoveries, matrix spike/matrix spike duplicate (MS/MSD) recoveries, LCSs, and field duplicate precision. These DQIs are expressed in terms of precision, accuracy, representativeness, completeness, comparability, and sensitivity. The results of the DQE are summarized below.

Precision

Field duplicates were collected to assess sampling precision. They consisted of duplicate Summa canisters collected at selected locations. Precision is best expressed in terms of relative percent difference (RPD). In general, the precision goals were generally acceptable in light of the dilutions needed to be made for high concentrations. Complete discussion of the duplicates is provided in the attached DQE narratives.

Accuracy

Accuracy was measured through the analyses of LCS or in this case laboratory duplicates. Sample specific accuracy is measured through surrogate recovery. Accuracy is expressed as percent recovery (%R). Complete discussion of the laboratory duplicates or surrogate results is discussed in the attached DQE narratives.

Recoveries for laboratory duplicates in associated air samples indicated estimated ("J" flagged) data qualification for three analytes in several SDGs (Dichlorodifluoromethane, 1,3,5-Trimethylbenzene, 1,2,4-Trichlorobenzene). In these instances, the laboratory duplicate recovery was either high or low in respective SDGs. However, there were no positive results above the RL in any of the associated samples. Complete discussion of the laboratory duplicates is provided in the attached DQE narratives.

Representativeness

Representativeness refers to the degree sample data accurately and precisely describes the population of samples at a sampling point or under certain environmental conditions. Samples that are not properly preserved or are analyzed beyond holding times may not be considered representative. Review of sampling procedures, laboratory preparation and analysis of holding times help in providing this assessment. Sampling procedures followed the work plan and were considered representative. Laboratory preparation and analysis followed method guidelines.

Comparability

The selection of standardized methods and consistent laboratory practices facilitates the comparison of data between SVE vapor sampling events. Previous event data are comparable to later event data.

Completeness

Completeness is determined for both field and analytical objectives. Field completeness is calculated from the number of samples planned verses the actual number of samples collected. Analytical completeness is expressed in terms of usable data. The project completeness goal stated in the DDMT RA SAP for DDMT is 90%. Data from the SVE events was 100% complete and therefore met this completeness DQO. On 16 July 2008 one sample FSVE-SVEA-3Q08 collected was not analyzed due to moisture in the canister but was recollected on 14 August 2008.

Sensitivity

Analytical sensitivity is the concentration at which the measurement system can quantitate target analytes in the environmental matrices of concern. Analytical sensitivity is expressed in terms of the reporting limit (RL), which is provided by the respective laboratories as their reasonable and defensible quantitation limit for environmental samples above the method detection limit (MDL), which is established by each laboratory using pure water or clean matrix. The RL varies among laboratories dependent upon their SOPs and expertise. The analytical method RLs and MDLs were compared to protective soil vapor concentrations as provided in Dunn Field Record of Decision and were determined to meet the overall project objectives. Dilutions were necessary in some cases to achieve the proper quantification of high-level targets, which raises the RLs for all other targets in the run. In such cases, the both results are provided in hardcopy except for the analytes that are above the upper range in the initial run. These are only shown for the reanalysis. Any elevated RLs due to dilution or other QC issues are discussed in the attached narratives.

The following sections discuss only those deficiencies encountered during the evaluation that resulted in qualified and/or unusable data.

SVE Sampling Events – From 25 July 2007 to 14 August 2008

A total of 143 summa canister air samples, including field duplicates, were collected during ten events from 25 July 2007 through 17 July 2008 during baseline and quarterly sampling events and during two rebound events. Samples were analyzed for VOCs using EPA Method TO-15. Any result reported below the reporting limit (RL) but above the method detection limit (MDL) was flagged "J" and considered an estimated result (unless overridden by other QC flags).

Chain-of-Custody

There were some slight discrepancies noted concerning the COCs. These have been reviewed and have been determined not to have impacted use of the data for its intended purpose.

Method Blanks:

Levels of several compounds are reported by the laboratory in the method blanks, all below the reporting limit but above the MDL. These have resulted in qualification of associated detections in samples when the sample result is less than 5x the method blank level (see the attached narrative for details). Such results are qualified B indicating the analyte was found in the blank. Data qualified as UB are usable as nondetected

values, with the reporting limit adjusted for such samples at the level of the result observed. For methylene chloride, results are qualified when the sample is less than 10x the blank level, since this compound is a common laboratory contaminant.

- Trichlorofluoromethane was qualified with a B associated with two samples (FSVE-SVE-MID-BASE1-NS and FSVE-VMP-08A-BASE1-NS) collected on 7/26/07 in SDG D7G260183.
- TCE was qualified with a B associated with sample SVE-EFF collected on 3 August 2007 in SDG D7H070280. In the same SDG, 1,2-dichloroethane was qualified B in three samples (SVE-INF, SVE-MID, SVE-EFF).
- TCE was detected in one method blank at a level below the reporting limit. Associated samples are higher than 5x the dilution-corrected method blank level, so no qualifiers were added**.**
- VC was qualified in three samples (SVE-INF, FSVE-INF-BASE4-NS, FSVE-SVE-G-BASE-4-NS), collected on 16 August 2008 and 23 August 2007 in SDGs D7H200107, D7H240201, and D7H240204, respectively.

Calibration

The method calibration %D limits are 30%. Where calibration is outside of QC limits, associated detections are qualified as J. Such results may be biased to a degree proportional to the calibration drift observed. Dichlorodifluoromethane in two samples (FSVE-SVE-B-1Q08-NS and FSVE-SVE-E-1Q08-NS) collected on 17 January 2008 in SDG D8A210123 had a > 30% D and were therefore qualified J based on calibration results.

Laboratory Control or Laboratory Duplicate Samples:

LCS or Laboratory Duplicate runs which had outliers that were on the low side and associated data are qualified estimated J, since results may be biased low. Similarly those on the high side may be biased high and associated data are qualified estimated J.

- Dichlorodifluoromethane was qualified J in five samples (FSVE-VMP-09B-BASE1-NS, FSVE-VMP-10B-BASE1-NS, FSVE-SVE-B-BASE1-NS, FSVE-SVE-C-BASE1-NS, FSVE-SVE-D-BASE1-NS), collected from 23 July to 25 July 2007 in SDG D7G260183 based on laboratory duplicate samples (LCS).
- Dichlorodifluoromethane was qualified J in two samples (FSVE-SVE-B-1Q08-NS and FSVE-SVE-E-1Q08-NS), collected on 17 January 2008 in SDG D8A210123 based on laboratory duplicate samples (LCS)..

- 1,3,5-Trimethylbenzene was qualified J in ten samples (FSVE-INF-BASE4-NS, FSVE-MID-BASE4-NS, FSVE-EFF-BASE4-NS FSVE-SVE-A-BASE-4-NS, FSVE-SVE-B-BASE-4-NS, FSVE-SVE-C-BASE-4-NS, FSVE-SVE-D-BASE-4-NS, FSVE-SVE-E-BASE-4-NS, FSVE-SVE-F-BASE-4-NS, FSVE-SVE-G-BASE-4-NS), collected on 23 August 2007 in SDGs D7H240204 and D7H240201, respectively based on laboratory duplicate samples (LCS)..
- 1,2,4-Trichlorobenzene was qualified J in eight samples (FSVE-SVE-A-4Q07-NS, FSVE-SVE-B-4Q07-NS, FSVE-SVE-C-4Q07-NS, FSVE-SVE-D-4Q07-NS, FSVE-SVE-E-4Q07-NS, FSVE-SVE-F-4Q07-NS, FSVE-SVE-G-4Q07-NS, FSVE-EFF-4Q07-NS) collected on 18 October 2007 in SDG D7J190217 based on laboratory duplicate samples (LCS).
- 1,2,4-Trichlorobenzene was qualified J in five samples (FSVE-VMP8A-RBND1A, FSVE-VMP6A-RBND1A, FSVE-SVEB-RBND1A. FSVE-SVEE-RBND1A, FSVE-SVEF-RBND1A), collected on 3 April 2008 in SDG D8D040210 based on laboratory duplicate samples (LCS).

Matrix Duplicates:

For validation purposes, only results > 5x PQL are qualified for RPD outliers. For results < 5x PQL, results are qualified if the absolute difference is greater than 2x PQL.

- 1,2-dichlorethane was qualified estimated J in one sample (FSVE-VMP-10A-BASE1-NS), collected on 23 July 2007 in SDG D7G260183 based on the elevated RPD.

Quantitation:

Note that the laboratory has reported results that are greater than the upper range of the calibration in some instances; these results are flagged with an E. In such cases, a second result is reported that is obtained from a run diluted to cause the result to fall within the calibration range. No data are qualified based upon dilutions above the calibration range since these were all brought into the calibration range on subsequent runs. Any value falling between the MDL and the RL is qualified as estimated J.

SUMMARY

The vapor sample data collected from July 2007 through August 2008 from the SVE wells and the VMPs have met the data quality objectives and are therefore deemed sufficient to support decisions regarding the effectiveness of the SVE system performance.

TABLE C-1
SDG SUMMARY TABLE
FLUVIAL SVE ANNUAL OPERATIONS REPORT - 2007/8
Dunn Field - Defense Depot Memphis, Tennessee

SDG	6-Liter Summa Air Canister Samples			Quality Control Samples
July 25 2007				
D7G26183	FSVE-VMP-01A-BASE1-NS	FSVE-VMP-06A-BASE1-NS	FSVE-SVE-A-BASE1-NS	FSVE-SVE-A-DUP
	FSVE-VMP-01B-BASE1-NS	FSVE-VMP-06B-BASE1-NS	FSVE-SVE-B-BASE1-NS	FSVE-SVE-F-DUP
	FSVE-VMP-02A-BASE1-NS	FSVE-VMP-07A-BASE1-NS	FSVE-SVE-C-BASE1-NS	FSVE-SVE-INF-DUP
	FSVE-VMP-02B-BASE1-NS	FSVE-VMP-07B-BASE1-NS	FSVE-SVE-D-BASE1-NS	
	FSVE-VMP-03A-BASE1-NS	FSVE-VMP-08A-BASE1-NS	FSVE-SVE-E-BASE1-NS	
	FSVE-VMP-03B-BASE1-NS	FSVE-VMP-08B-BASE1-NS	FSVE-SVE-F-BASE1-NS	
	FSVE-VMP-04A-BASE1-NS	FSVE-VMP-09A-BASE1-NS	FSVE-SVE-G-BASE1-NS	
	FSVE-VMP-04B-BASE1-NS	FSVE-VMP-09B-BASE1-NS	FSVE-SVE-INF-BASE1-NS	
	FSVE-VMP-05A-BASE1-NS	FSVE-VMP-10A-BASE1-NS	FSVE-SVE-MID-BASE1-NS	
	FSVE-VMP-05B-BASE1-NS	FSVE-VMP-10B-BASE1-NS	FSVE-SVE-EFF-BASE1-NS	
August 3 2007				
D7H07280	FSVE-INF-BASE2-NS	FSVE-MID-BASE2-NS	FSVE-EFF-BASE2-NS	
August 16 2007				
D7H200107	FSVE-INF-BASE3-NS	FSVE-MID-BASE3-NS	FSVE-EFF-BASE3-NS	
August 23 2007				
D7H240201	FSVE-SVE-A-BASE4-NS	FSVE-SVE-E-BASE4-NS	FSVE-INF-BASE4-NS	FSVE-INF-DUP
	FSVE-SVE-B-BASE4-NS	FSVE-SVE-F-BASE4-NS	FSVE-MID-BASE4-NS	FSVE-SVE-C-DUP
D7H240204	FSVE-SVE-C-BASE4-NS	FSVE-SVE-G-BASE4-NS	FSVE-EFF-BASE4-NS	
	FSVE-SVE-D-BASE4-NS			
September 19 2007				
D7I200250	FSVE-SVE-A-BASE5-NS	FSVE-SVE-E-BASE5-NS	FSVE-INF-BASE4-NS	FSVE-INF-DUP
	FSVE-SVE-B-BASE5-NS	FSVE-SVE-F-BASE5-NS	FSVE-MID-BASE4-NS	
	FSVE-SVE-C-BASE5-NS	FSVE-SVE-G-BASE5-NS	FSVE-EFF-BASE4-NS	
	FSVE-SVE-D-BASE5-NS			
October 18 2007				
D7J190217	FSVE-SVE-A-4Q07-NS	FSVE-SVE-D-4Q07-NS	FSVE-SVE-G-4Q07-NS	FSVE-SVE-E-DUP
	FSVE-SVE-B-4Q07-NS	FSVE-SVE-E-4Q07-NS	FSVE-EFF-4Q07-NS	
	FSVE-SVE-C-4Q07-NS	FSVE-SVE-F-4Q07-NS		
January 17 2008				
D8A210123	FSVE-SVE-A-1Q08-NS	FSVE-SVE-D-1Q08-NS	FSVE-SVE-G-1Q08-NS	FSVE-INF-DUP
	FSVE-SVE-B-1Q08-NS	FSVE-SVE-E-1Q08-NS	FSVE-INF-1Q08-NS	
	FSVE-SVE-C-1Q08-NS	FSVE-SVE-F-1Q08-NS		
April 3 2008				
D8D040210	FSVE-SVEB-RBND-1A	FSVE-VMP2B-RBND-1A	FSVE-VMP7B-RBND-1A	
	FSVE-SVEE-RBND-1A	FSVE-VMP6A-RBND-1A	FSVE-VMP8A-RBND-1A	
	FSVE-SVEF-RBND-1A	FSVE-VMP6B-RBND-1A	FSVE-VMP8B-RBND-1A	
	FSVE-VMP2A-RBND-1A	FSVE-VMP7A-RBND-1A		
April 17 2008				
D8D210122	FSVE-VMP2A-RBND1B	FSVE-VMP7A-RBND1B	FSVE-SVEE-RBND1B	FSVE-DUP1-RBND1B
	FSVE-VMP2B-RBND1B	FSVE-VMP8A-RBND1B	FSVE-SVEF-RBND1B	
	FSVE-VMP6A-RBND1B	FSVE-VMP8B-RBND1B	FSVE-VMP7B-RBND1B	
	FSVE-VMP6B-RBND1B	FSVE-SVEB-RBND1B		
April 24 2008				
D8D250300	FSVE-SVE-A-2Q08	FSVE-SVE-E-2Q08	FSVE-SVE-G-2Q08	FSVE-SVE-F-DUP
	FSVE-SVE-B-2Q08	FSVE-SVE-F-2Q08	FSVE-INF-2Q08	
	FSVE-SVE-C-2Q08			
May 6 2008				
D8E070213	FSVE-SVE-D-2Q08			FSVE-SVE-D-DUP

TABLE C-1
SDG SUMMARY TABLE
FLUVIAL SVE ANNUAL OPERATIONS REPORT - 2007/8
Dunn Field - Defense Depot Memphis, Tennessee

SDG	6-Liter Summa Air Canister Samples			Quality Control Samples
July 16 2008				
	FSVE-SVE-B-3Q08	FSVE-VMP3B-3Q08	FSVE-VMP6A-3Q08	FSVE-DUP1-3Q08
	FSVE-SVE-C-3Q08	FSVE-VMP1A-3Q08	FSVE-VMP6B-3Q08	FSVE-DUP2-3Q08
	FSVE-SVE-D-3Q08	FSVE-VMP1B-3Q08	FSVE-VMP7A-3Q08	FSVE-DUP3-3Q08
	FSVE-SVE-E-3Q08	FSVE-VMP4A-3Q08	FSVE-VMP10B-3Q08	
D8G170286	FSVE-SVE-F-3Q08	FSVE-VMP5A-3Q08	FSVE-VMP7B-3Q08	
D8G180218	FSVE-SVE-G-3Q08	FSVE-VMP8A-3Q08	FSVE-VMP8B-3Q08	
	FSVE-INF-3Q08	FSVE-VMP9B-3Q08	FSVE-VMP9A-3Q08	
	FSVE-VMP2A-3Q08	FSVE-VMP10A-3Q08		
	FSVE-VMP2B-3Q08	FSVE-VMP4B-3Q08		
	FSVE-VMP3A-3Q08	FSVE-VMP5B-3Q08		
August 14 2008				
D8H150287	FSVE-SVEA-3Q08			

ORGANIC AIR QUALITY REPORT
METHOD TO-15

SDG: D7H240201, D7H070280, D7H200107, D7H240204, D7J190217, D7G260183, D7I200250

PROJECT: Memphis Defense Depot , Soil Vapor Extraction, 3202-031-01-05 for e2m, Texas

LABORATORY: TestAmerica, Denver Colorado, 1 SDG subcontracted to TestAmerica Knoxville

SAMPLE MATRIX: Air

SAMPLING DATE (Month/Year): September 2007

NUMBER OF SAMPLES: 71 air samples

ANALYSES REQUESTED: Summa Canister VOA TO-15

SAMPLE NO.: Samples attached

DATA REVIEWER: John and Sammy Huntington, Gateway Enterprises

QA REVIEWER: Diane Short & Associates, Inc. INITIALS/DATE: _____

Telephone Logs included Yes____ No __X__

Contractual Violations Yes____ No __X_

The EPA CLP National Functional Guidelines for Organic Data Review, 1999 (SOP), EPA Method TO-15 current updates have been referenced by the reviewer to perform this data validation review. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of the Project Manager . Per the Scope of Work, the review of these samples includes validation of all QC forms referencing the QC limits in the above documents.

I. DELIVERABLES
All deliverables were present as specified in the Statement of Work (SOW) or in the project contract.
Yes __ No _X__
Calibration forms were not provided for the following SDGs:D7H070280, D7J190217, D7G260183

The Case Narratives provide a statement indicating those targets that are outside the 30% D window in the continuing calibrations. We have used this information in the review of these SDGs in the absence of the specific calibration data.

II. ANALYTICAL REPORT FORMS
A. The Analytical Report or Data Sheets are present and complete for all requested analyses.
Yes __X__ No___

B. Holding Times
The contract holding times were met for all analyses (Time of sample receipt to time of analysis (VOA) or extraction and from extraction to analysis). Contract holding times for TO-15 canisters is 30 days from date of collection.
Yes __X___ No____

C. Chains of Custody
Chains of Custody were present and were complete with signatures, sign-offs and complete entry of data. Canisters were properly sampled and received.
Yes ___X__ No _____
All SDGs had a gap in time between relinquished and received that was supported with the FedEx air bill number.
SDG D7G260183: There were changes to the body of the chains of custody without initials for page 1-5; there was no received information for pages 2-6.

D. Canister Pressure
Canister pressures were measured and recorded for initial vacuum check, initial field vacuum, final field reading, lab initial pressure and final pressure.
Yes _____ No _____ NA ___X_____
Not part of this review level.

All readings met the limits or exceptions were noted and pressure corrected
Yes _____ No ____ NA __X__
Not part of this review level.

III. INSTRUMENT CALIBRATION
Calibration forms were not provided for the following SDGs:D7H070280, D7J190217, D7G26018. In the absence of any comment, the calibration is assumed to be in control.

The Case Narratives provide a statement indicating those targets that are outside the 30% D window in the continuing calibrations. We have used this information in the review of these SDGs in the absence of the specific calibration data.

Note that the laboratory has reported results that are greater than the upper range of the calibration in some instances; these results are flagged with an E, and have been qualified as JE to indicate that they lie outside the calibration range. In such cases, a second result is reported that is obtained from a run diluted to cause the result to fall within the calibration range.

A. Initial Calibration – GC/MS
1. The Relative Response Factors (RRF) and average RRF for all compounds for all analyses met the required criteria.
Yes __X__ No____
For the packages containing calibration information, this has been directly verified.

This method does not involve purging water samples. Consequently, all targets, including the typical poor-purging compounds, have response factors that are above validation criteria for volatiles. All response factors are above the validation limit of 0.05.

The relative standard deviation (RSD) for the five-point calibration was within the 30% limit.
Yes __X__ No ____
For the packages containing calibration information, this has been directly verified.

B. Continuing Calibration – GC/MS
1. The RRF standard was analyzed for each analysis at the required frequency and the QC criteria were met
Yes __X__ No____
For the packages containing calibration information, this has been directly verified.

This method does not involve purging water samples. Consequently, all targets, including the typical poor-purging compounds, have response factors that are above validation criteria for volatiles.

2. The percent difference (%D) limits were met.
Yes ____ No __X__
Calibration forms were not provided for the following SDGs: D7H070280, D7J190217, D7G260183

The Case Narratives provide a statement indicating those targets that are outside the 30% D window in the continuing calibrations. We have used this information in the review of these SDGs in the absence of the specific calibration data.

The method %D limits are 30%. The validation %D limits are 25%. Several compounds are out of the validation %D limits of 25% as shown in the table, but still within method limits. Although listed in the table for information purposes, qualifiers are not added because the results meet method criteria. For %D outliers above 30%, when associated samples have detections, the result is qualified as JC#, where # is the %D outlier. Such results may be biased to a degree proportional to the calibration drift observed.

SDG	CCV Date	Lab Sam #	Analyte	%D	Qualifier
D7H240204	8/27/07 12:53	1-9, 1RE, 6RE	Trichloroethene	29.07	None
			Toluene	25.75	None
			Ethylbenzene	27.55	None
			M&P Xylenes	26.69	None
			Styrene	26.53	None
			1,3,5 Trimethylbenzene	31.55	None, samples ND
			1,2,4 Trimethylbenzene	25.97	None
D7H240201	8/27/07 12:53	1-3	Trichloroethene	29.07	None
			Toluene	25.75	None
			Ethylbenzene	27.55	None
			M&P Xylenes	26.69	None

SDG	CCV Date	Lab Sam #	Analyte	%D	Qualifier
			Styrene	26.53	None
			1,3,5 Trimethylbenzene	31.55	None, samples ND
			1,2,4 Trimethylbenzene	25.97	None
D7I200250	9/25/07 9:10		1,3,5 Trimethylbenzene	37.28	None, samples ND
			1,2,4 Trimethylbenzene	33.05	None, samples ND
D7G260183	From narrative		Dichlorodifluoromethane	> 30	None, samples ND
D7J190217	From narrative		1,2,4-trichlorobenzene	> 30	None, samples ND

IV. GC/MS INSTRUMENT PERFORMANCE CHECK
A. The BFB performance check was injected once at the beginning of each 12-hour period and relative abundance criteria for the ions were met.
Yes _____ No____ NA __X__
Not part of this review level.

V. INTERNAL STANDARDS
A. Area Limits
The Internal Standards met the 100% upper and -50% lower limits criteria and the Retention times were within the required windows.
Yes _____ No____ NA __X__
Not part of this review level.

B. Retention Times
The relative retention times of the internal standards and sample compounds met the $\pm$ 0.06 RRT units limit.
Yes _____ No____ NA __X__
Not part of this review level.

VI. SURROGATE
Surrogate spikes were analyzed with every sample.
Yes __X___ No ____

And met the recovery limits defined in the current contract
Yes __X__ No ____

VII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE
A. Matrix spike (MS) and matrix spike duplicates (MSD) were analyzed for every analysis performed and for every 20 samples or for every matrix whichever is more frequent.
Yes____ No ____NA ___X__
Spikes are not amenable to canister analysis and are not required. Laboratory duplicates are required and are provided by the laboratory.

B. The MD relative percent differences (RPD) were within the defined contract limits. Method requirements are 25% maximum RPD.
Yes ____ No __X__ NA____
For validation purposes, only results > 5x PQL are qualified for RPD outliers. For results < 5x PQL, results are qualified if the absolute difference is greater than 2x PQL. The qualifier added is JD#, where # is the RPD or the absolute difference observed, as appropriate. One target was qualified in SDG D7B260183.

SDG	Parent	Observations

SDG	Parent	Observations
D7G260183	FSVE-VMP-02A-BASE1-NS	OK
	FSVE-VMP-08A-BASE1-NS	OK
	FSVE-VMP-10A-BASE1-NS	1,2-DCA RPD 99%; qualified JD99
	FSVE-SVE-B-BASE1-NS	OK
D7H070280	SVE-INF	OK
D7H200107	SVE-MID DUP	OK
D7H240201	FSVE-EFF-BASE4-NS	OK
D7H240204	D7H240204006	OK
D7I200250	FSVE-SVE-F-BASE5-NS	OK
D7J190217	FSVE-SVE-E-4Q07-DUP	OK
	FSVE-SVE-A-4Q07-NS	OK (only used for chloroform and TCE)

VIII. DUPLICATE CONTROL SAMPLES

A. Duplicate Control and Duplicate Control Sample Duplicates similar to Laboratory Control Samples (LCS) were performed for every set.

Yes _X_ No___

B. And percent recoveries were acceptable at 70 – 130%.

Yes ____ No __X_

A few of the LCS runs had outliers that were on the low side. In such cases, the target impacted is qualified in all samples associated with the batch as JL#, where # is the recovery observed. Such results may be biased low by approximately amount of the recovery observed.

SDG	Batch	Analyte	Recovery	Qualifiers
D7G260183	7215121	All OK		None
	7218103	All OK		None
	7219036	Dichlorodifluoromethane	63	JL63
	7221288	All OK		None
D7H070280	7225092	All OK		None
D7H200107	7239390	All OK		None
D7H240201	7240149	1,3,5-Trimethylbenzene	68	JL68
D7H240204	7240149	1,3,5-Trimethylbenzene	68	JL68
D7I200250	7269202	All OK		None
D7J190217	7299099	1,2,4-Trichlorobenzene	64	JL64
	7302308	All OK		None

C. And Relative Percent Differences were within lab limits.

Yes ___ No____ NA__X__

The laboratory does not perform LCS duplicates.

IX. SHIFT CHECKS

Shift checks were performed and were within time limits.

Yes __X__ No____

X. BLANKS

A. Method Blanks were analyzed at the required frequency and for each matrix and analysis.

Yes __X___ No____

This is a nitrogen blank run with each set.

B. The method blank was free of contamination.
Yes _____ No __X___
Levels of several compounds are reported by the laboratory in the method blanks, all below the reporting limit but above the MDL. These have resulted in qualification of associated detections in samples when the sample result is less than 5x the method blank level (see the table). Such results are qualified as UB#, where # is the method blank result. For methylene chloride, results are qualified when the sample is less than 10x the blank level, since this compound is a common laboratory contaminant.

Data qualified as UB or UB# are usable as nondetected values, with the reporting limit adjusted for such samples at the level of the result observed.

SDG	Batch	Analyte	Result	Qualifier
D7G260183	7215121	Methylene chloride	0.43F	UB# Detects < 10x MB
	7215121	Trichlorofluoromethane	0.066F	UB# detect < 5x MB
	7218103	Methylene chloride	0.45F	UB# Detects < 10x MB
	7218103	Trichloroethene	0.39F	None, results > 5x MB
	7218103	Trichlorofluoromethane	0.062F	UB# detects < 5x MB
	7219036	Methylene chloride	0.065F	UB# Detects < 10x MB
	7219036	Trichloroethene	0.093F	None, results > 5x MB
	7221288	Methylene chloride	0.39F	UB# Detects < 10x MB
	7221288	Trichlorofluoromethane	0.06F	UB# detect < 5x MB
D7H070280	7225092	1,2-Dichloroethane	0.081F	UB# detects < 5x MB
	7225092	Methylene chloride	0.063F	UB# Detects < 10x MB
	7225092	Trichloroethene	0.068F	UB# one result < 5x MB
D7H200107	7239390	Methylene chloride	0.05F	UB# Detects < 10x MB
	7239390	Vinyl chloride	0.11F	UB# detect < 5x MB
D7H240201	7240149	Vinyl chloride	0.11F	UB# detect < 5x MB
D7H240204	7240149	Vinyl chloride	0.11F	UB# detects < 5x MB
D7I200250	7269202		All OK	None
D7J190217	7299099	Methylene chloride	0.054F	UB# Detects < 10x MB
	7302308		All OK	None

C. If Field Blanks were identified, they were free of contamination.
Yes _____ No ____ NA ___X___
There were no field blanks identified.

D. Contamination level was less than 0.03 mg/cubic meter before samples were analyzed per the method.
Yes ____ No____ NA ____X___
Not part of this review level.

XI. FIELD QC
A. If Field duplicates or Performance Check Compounds were identified, they met the RPD or % recovery criteria for the project.
Yes _ __ No __X__ NA___
Qualifiers are not added for field duplicate differences. Observations are provided in the table below. When results are > 5x the reporting limit, a 35% RPD is used to identify potential deviations. When results are < 5x

the reporting limit, an absolute difference between the results that is < 2x PQL is considered to be acceptable reproducibility.

Many of these samples contain very high levels of target and required dilution in order to produce results falling within the calibration range. The amount of dilution required may contribute to the variability in the results in some cases, and in some cases it may simply reflect the degree of variability in the air concentrations present. The difference also depends on if these are co-located samples (canisters right next to each other collected at same time) or sequential (canister collected at same location, but following the time of collection of the parent).

SDG	SAMPLE	FIELD DUP	OBSERVATIONS
D7G260183	FSVE-SVE-F-BASE1-NS	FSVE-SVE-F-BASE1-DUP	1,1,2,2-Tetrachloroethane RPD 40%;
	FSVE-SVE-A-BASE1-NS	FSVE-SVE-A-BASE1-DUP	1,2-DCA 270 in sample, 2000 in dup
	FSVE-SVE-INF-BASE1-NS	FSVE-SVE-INF-BASE1-DUP	1,1,2,2-Tetrachloroethane RPD 51%; Chloroform RPD 51%; cis-1,2-Dichloroethene RPD 50%
D7H240204	FSVE-SVE-C-BASE-4-NS	FSVE-SVE-C-BASE-4-DUP	Chloroform 4200 in DUP, 330 in sample; cis-1,2-Dichloroethene RPD 38%
	FSVE-INF-BASE-4-NS	FSVE-INF-BASE-4-DUP	1,1,2,2-Tetrachloroethane RPD 154%; Carbon tetrachloride RPD 82%; Chloroform RPD 93%; cis-1,2-Dichloroethene RPD 91%; TCE RPD 67%
D7I200250	FSVE-INF-BASE5-NS	FSVE-INF-BASE5-DUP	1,1,2,2-Tetrachloroethane RPD 109%
D7J190217	SVE-SVE-E-4Q07	FSVE-SVE-E-4Q07-DUP	OK

XII. SYSTEM PERFORMANCE
The RICs, chromatograms, tunes and general system performance were acceptable for all instruments and analytical systems
Yes ___ No ____NA__X___
Not part of this review level.

XIII. TCL COMPOUNDS
A. The identification is accurate and all retention times, library spectra and reconstructed ion chromatograms (RIC) were evaluated for all detected compounds:
For this project, ten percent of the data are fully review for chromatograms and spectra.
Yes ___ No____ NA__X_
Not part of this review level.

B. Quantitation was checked to determine the accuracy of calculations for representative compounds in each internal standard set
Yes___ No ____ NA___X__
Not part of this review level.

OVERALL ASSESSMENT
Data are considered to be usable for project purposes after consideration of qualifiers. Points of significance are summarized below:

Deliverables:
Calibration forms were not provided for the following SDGs: D7H070280, D7J190217, D7G260183

The Case Narratives provide a statement indicating those targets that are outside the 30% D window in the continuing calibrations. We have used this information in the review of these SDGs in the absence of the specific calibration data.

Chain of Custody:
All SDGs had a gap in time between relinquished and received that was supported with the FedEx air bill number.
SDG D7G260183: There were changes to the body of the chains of custody without initials for page 1-5; there was no received information for pages 2-6.

Continuing Calibrations:
For the packages containing calibration information.
This method does not involve purging water samples. Consequently, all targets, including the typical poor-purging compounds, have response factors that are above validation criteria for volatiles. All response factors are above the validation limit of 0.05.

The method %D limits are 30%. The validation %D limits are 25%. Several compounds are out of the validation %D limits of 25% as shown in the table within the report body, but still within method limits. Although listed in the table for information purposes, qualifiers are not added because the results meet method criteria. For %D outliers above 30%, when associated samples have detections, the result is qualified as JC#, where # is the %D outlier. Such results may be biased to a degree proportional to the calibration drift observed.

Matrix Duplicates:
For validation purposes, only results > 5x PQL are qualified for RPD outliers. For results < 5x PQL, results are qualified if the absolute difference is greater than 2x PQL. The qualifier added is JD#, where # is the RPD or the absolute difference observed, as appropriate. One target was qualified in SDG D7B260183.

Laboratory Control Samples:
A few of the LCS runs had outliers that were on the low side. In such cases, the target impacted is qualified in all samples associated with the batch as JL#, where # is the recovery observed. Such results may be biased low by approximately amount of the recovery observed.

Method Blanks:
Levels of several compounds are reported by the laboratory in the method blanks, all below the reporting limit but above the MDL. These have resulted in qualification of associated detections in samples when the sample result is less than 5x the method blank level (see the table within the report body). Such results are qualified as UB#, where # is the method blank result. For methylene chloride, results are qualified when the sample is less than 10x the blank level, since this compound is a common laboratory contaminant.

Data qualified as UB or UB# are usable as nondetected values, with the reporting limit adjusted for such samples at the level of the result observed.

Field Duplicates:
Qualifiers are not added for field duplicate differences. Observations are provided in the table below. When results are > 5x the reporting limit, a 35% RPD is used to identify potential deviations. When results are < 5x

the reporting limit, an absolute difference between the results that is < 2x PQL is considered to be acceptable reproducibility.
Many of these samples contain very high levels of target and required dilution in order to produce results falling within the calibration range. The amount of dilution required may contribute to the variability in the results in some cases, and in some cases it may simply reflect the degree of variability in the air concentrations present. The difference also depends on if these are co-located samples (canisters right next to each other collected at same time) or sequential (canister collected at same location, but following the time of collection of the parent).

Quantitation:
Note that the laboratory has reported results that are greater than the upper range of the calibration in some instances; these results are flagged with an E, and have been qualified as JE to indicate that they lie outside the calibration range. In such cases, a second result is reported that is obtained from a run diluted to cause the result to fall within the calibration range.

ORGANIC AIR QUALITY REPORT
METHOD TO-15

SDG: D8A210123, D8D040210, D8E070213, D8D250300, D8D210122

PROJECT: Memphis Defense Depot Soil Vapor Extraction, for e2m, Texas

LABORATORY: TestAmerica, Denver Colorado, subcontracted to TestAmerica Knoxville

SAMPLE MATRIX: Air

SAMPLING DATE (Month/Year): January, April 2008

NUMBER OF SAMPLES: 42 air samples

ANALYSES REQUESTED: Summa Canister VOA TO-15

SAMPLE NO.: Samples attached

DATA REVIEWER: John and Sammy Huntington, Gateway Enterprises

QA REVIEWER: Diane Short & Associates, Inc. INITIALS/DATE: _____

Telephone Logs included Yes____ No __X__

Contractual Violations Yes____ No __X_

The EPA CLP National Functional Guidelines for Organic Data Review, 1999/ 2001 (SOP), EPA Method TO-15 current updates have been referenced by the reviewer to perform this data validation review. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of the Project Manager . Per the Scope of Work, the review of these samples includes validation of all QC forms referencing the QC limits in the above documents.

A. DELIVERABLES
All deliverables were present as specified in the Statement of Work (SOW) or in the project contract.
Yes __ No _X__
Calibration forms were not provided for the following SDGs: D8A210123, D8D040210, D8E070213, D8D250300, D8D210122

Case Narratives did not discuss calibration data for the following SDGs: D8E070213, D8D250300, D8D210122

SDG D8D250300 – sample FSVE-SVED-2Q08-NS was lost during preparation.

Some Case Narratives provide a statement indicating those targets that are outside the 30% D window in the continuing calibrations. We have used this information in the review of these SDGs in the absence of the specific calibration data.

II. ANALYTICAL REPORT FORMS
A. The Analytical Report or Data Sheets are present and complete for all requested analyses.
Yes __X__ No___

B. Holding Times
The contract holding times were met for all analyses (Time of sample receipt to time of analysis (VOA) or extraction and from extraction to analysis). Contract holding times for TO-15 canisters is 30 days from date of collection.
Yes __X___ No____

C. Chains of Custody
Chains of Custody were present and were complete with signatures, sign-offs and complete entry of data. Canisters were properly sampled and received.
Yes __X___ No __ ___
The project manager is informed of the following and the chains are being completed for the project record.

All SDGs had a gap in time between relinquished and received that was supported with the FedEx air bill number.

SDG D8D040210: The sample receipt form answered "No" to whether the custody seals present/intact on cooler and/or containers.

SDG D8D210122: There were changes to the body of the chain of custody without initials for page 1

SDG D8D210122: There were changes to the body of the chain of custody without initials for page 1and two; no received information on page 2 of chain of custody.

The Sample Receipt Checklist stated that the following Canister IDs were incorrectly listed on the COC and what they should be:

SDG	COC	Should Be
D8D250300	52742	04186
	61861	11369
	64340	12522
	63872	12185
	64867	93219
D8D210122	52727	04165
	2972	02792
	64208	92068
	4337	04337

D. Canister Pressure

Canister pressures were measured and recorded for initial vacuum check, initial field vacuum, final field reading, lab initial pressure and final pressure.
Yes _____ No _____ NA ___X_____
Not part of this review level.

All readings met the limits or exceptions were noted and pressure corrected
Yes _____ No ____ NA __X__
Not part of this review level.

III. INSTRUMENT CALIBRATION

A. Initial Calibration – GC/MS

1. The Relative Response Factors (RRF) and average RRF for all compounds for all analyses met the required criteria.
Yes ____ No____ NA__X__
Minimum response factors are not defined by the TO-15 method. The calibration information needed to assess this against validation guidance is not present in the data packages.

This method does not involve purging water samples. Consequently, all targets, including the typical poor-purging compounds, normally have response factors that are acceptable for validation criteria for volatiles.

Some Case Narratives provide a statement indicating those targets that are outside the 30% D window in the continuing and initial calibrations. We have used this information in the review of these SDGs in the absence of the specific calibration data.

Calibration forms were not provided for the following SDGs: D8A210123, D8D040210, D8E070213, D8D250300, D8D210122. Calibrations were discussed in the Case Narratives except as indicated below.

Case Narratives did not list calibration information for the following SDGs: D8E070213, D8D250300, D8D210122. In the absence of any comment, the calibration is assumed to be in control.

The relative standard deviation (RSD) for the five-point calibration was within the 30% limit.
Yes ____ No __X__
This is evaluated on the basis of the Case Narrative information.
SDG D8A210123, initial calibration date 1/16/08: RSD > 30% for 1,2,4-trichlorobenzene. Detected data for this compound would be qualified JC+ with no number provided as one is not given in the narrative. A potential high bias could be associated with these data.

B. Continuing Calibration – GC/MS
1. The RRF standard was analyzed for each analysis at the required frequency and the QC criteria were met
Yes ____ No____ NA__X__
Minimum response factors are not defined by the method. The calibration information needed to assess this against validation guidance is not present in the data packages.

This method does not involve purging water samples. Consequently, all targets, including the typical poor-purging compounds, normally have response factors that are acceptable per validation criteria for volatiles.

2. The percent difference (%D) limits were met.
Yes ____ No __X__
This is evaluated from available Case Narrative information.

SDG D8D040210, calibration date 4/24/08: 1,2,4-trichlorobenzene > 30% D; chloroethane > 40% D.
No targets are detected, and no qualifiers are added.

SDG D8A210123, calibration date 1/30/08: dichlorodifluoromethane > 30% D.
Associated detections are qualified as JC, since the specific %D is not provided by the laboratory.
The method %D limits are 30%. The validation %D limits are 25%. Such results may be biased to a degree proportional to the calibration drift observed.

IV. GC/MS INSTRUMENT PERFORMANCE CHECK
A. The BFB performance check was injected once at the beginning of each 12-hour period and relative abundance criteria for the ions were met.
Yes _____ No____ NA __X__
Not part of this review level.

V. INTERNAL STANDARDS
A. Area Limits
The Internal Standards met the 100% upper and -50% lower limits criteria and the Retention times were within the required windows.
Yes _____ No____ NA __X__
Not part of this review level.

B. Retention Times
The relative retention times of the internal standards and sample compounds met the $\pm$ 0.06 RRT units limit.
Yes _____ No____ NA __X__
Not part of this review level.

VI. SURROGATE
Surrogate spikes were analyzed with every sample.
Yes __X___ No ____

And met the recovery limits defined in the current contract
Yes __X__ No ____

VII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A. Matrix spike (MS) and matrix spike duplicates (MSD) were analyzed for every analysis performed and for every 20 samples or for every matrix whichever is more frequent.
Yes____ No ____NA ___X__
Spikes are not amenable to canister analysis and are not required. Laboratory duplicates are required and are provided by the laboratory.
Laboratory Duplicates were conducted on seven samples.

B. The MD relative percent differences (RPD) were within the defined contract limits. Method requirements are 25% maximum RPD.
Yes __X__ No ____ NA____
For validation purposes, only results > 5x PQL are qualified for RPD outliers. For results < 5x PQL, results are qualified if the absolute difference is greater than 2x PQL. The qualifier added is JD#, where # is the RPD or the absolute difference observed, as appropriate. No qualifiers are added.

SDG	Client Sample ID	Lab Sample ID	Observations	Qualifiers
D8A210123	FSVE-SVE-G-1Q08-NS	D8A210123006	In control	None
D8D040210	FSVE-VMP8A-RBND1A	D8D040210002	In control	None
D8D210122	FSVE-VMP2A-RBND1B	D8D210122001	In control	None
	FSVE-VMP7B-RBND1B	D8D210122006	In control	None
D8D250300	FSVE-SVEB-2Q08-NS	D8D250300002	In control	None
	FSVE-SVEG-2Q08-NS	D8D250300007	In control	None
D8E070213	FSVE-SVED-2Q08	D8E070213001	In control	None

VIII. DUPLICATE CONTROL SAMPLES
A. Duplicate Control and Duplicate Control Sample Duplicates similar to Laboratory Control Samples (LCS) were performed for every set.
Yes _X_ No___

B. And percent recoveries were acceptable at 70 – 130%.
Yes ____ No __X_
One LCS run had an outlier for 1,2,4-trichlorobenzene on the low side. In such cases, the target impacted is qualified in all samples associated with the batch as JL#, where # is the recovery observed. Such results may be biased low by approximately amount of the recovery observed.
In another batch, dichlorodifluoromethane is recovered high, and has associated detections. These detections are qualified JL# and may be biased high.

SDG	Batch	Analyte	Recovery	Qualifiers
D8A210123	8031028	Dichlorodifluoromethane	140	JL140 detections
D8D040210	8116323	1,2,4-Trichlorobenzene	67	JL67 all samples in batch
D8D040210	8116323	Chloroethane	171	None, samples ND

C. And Relative Percent Differences were within lab limits.
Yes ___ No____ NA__X__
The laboratory does not perform LCS duplicates, nor are they required in the method.

IX. SHIFT CHECKS
Shift checks were performed and were within time limits.

Yes __X__ No____

X. BLANKS
A. Method Blanks were analyzed at the required frequency and for each matrix and analysis.
Yes __X___ No____
This is a nitrogen blank run with each set.

B. The method blank was free of contamination.
Yes _____ No __X___
Methylene chloride is detected below the reporting limit in a number of method blanks. For methylene chloride, results are qualified when the sample is less than 10x the dilution-corrected blank level, since this compound is a common laboratory contaminant.

TCE was detected in one method blank at a level below the reporting limit. Associated samples are higher than 5x the dilution-corrected method blank level, so no qualifiers are added.

Data qualified as UB or UB# are usable as nondetected values, with the reporting limit adjusted for such samples at the level of the result observed.

SDG	Batch	Analyte	Result	Qualifier
D8A210123	8031028	Methylene chloride	0.12F	UB# detects
D8D040210	8115083	Methylene chloride	0.065F	UB# detects
D8D040210	8115083	Trichloroethene	0.069F	None, results > 5x MB
D8D040210	8116323		All OK	None
D8D210122	8126374	Methylene chloride	0.077F	UB# detects
D8D210122	8127234	Methylene chloride	0.098F	UB# detects
D8D210122	8127527		All OK	None
D8D250300	8126374	Methylene chloride	0.077F	UB# detects
D8D250300	8127234	Methylene chloride	0.098F	UB# detects
D8D250300	8127527		All OK	None
D8E070213	8137158	Methylene chloride	0.09F	UB# detects

C. If Field Blanks were identified, they were free of contamination.
Yes _____ No ____ NA ___X___
There were no field blanks identified.

D. Contamination level was less than 0.03 mg/cubic meter before samples were analyzed per the method.
Yes ____ No____ NA ____X___
Not part of this review level.

XI. FIELD QC
A. If Field duplicates or Performance Check Compounds were identified, they met the RPD or % recovery criteria for the project.
Yes ___ No __X__ NA___
Qualifiers are not added for field duplicate differences. Observations are provided in the table below. When results are > 5x the reporting limit, a 35% RPD is used to identify potential deviations. When results are < 5x the reporting limit, an absolute difference between the results that is < 2x PQL is considered to be acceptable reproducibility.

Three field duplicates were identified, as shown in the table below. Most targets meet criteria, a few are outside of these limits. Many of these samples contain very high levels of target and required dilution in order to produce results falling within the calibration range. The amount of dilution required may contribute to the variability in the results in some cases, and in some cases it may simply reflect the degree of variability in the air concentrations present. The difference also depends on if these are co-located samples (canisters right next to each other collected at same time) or sequential (canister collected at same location, but following the time of collection of the parent).

SDG	SAMPLE	FIELD DUP	OBSERVATIONS
D8A210123	FSVE-INF-1Q08-NS	FSVE-INF-1Q08-DUP	In control
D8D210122	FSVE-SVEB-RBND1B	FSVE-DUP1-RBND1B	1,1,2,2-tetrachloroethane RPD=94%; all others meet criteria
D8D250300	FSVE-SVEF-2Q08-NS	FSVE-DUP1-2Q08-NS	Toluene RPD 191%; TCE RPD 81%; all others meet criteria

XII. SYSTEM PERFORMANCE
The RICs, chromatograms, tunes and general system performance were acceptable for all instruments and analytical systems
Yes ___ No ____NA__X___
Not part of this review level.

XIII. TCL COMPOUNDS
A. The identification is accurate and all retention times, library spectra and reconstructed ion chromatograms (RIC) were evaluated for all detected compounds:
For this project, ten percent of the data are fully review for chromatograms and spectra.
Yes ___ No____ NA__X_
Not part of this review level.

B. Quantitation was checked to determine the accuracy of calculations for representative compounds in each internal standard set
Yes___ No ____ NA___X__
Not part of this review level.

OVERALL ASSESSMENT
Data are considered to be usable for project purposes after consideration of qualifiers. Points of significance are summarized below:

Deliverables:
Calibration forms were not provided for the following SDGs: D8A210123, D8D040210, D8E070213, D8D250300, D8D210122

Case Narratives did not discuss calibration data for the following SDGs: D8E070213, D8D250300, D8D210122

SDG D8D250300 – sample FSVE-SVED-2Q08-NS was lost during preparation.

Some Case Narratives provide a statement indicating those targets that are outside the 30% D window in the continuing calibrations. We have used this information in the review of these SDGs in the absence of the specific calibration data.

Chain of Custody:
The project manager is informed of the following and the chains are being completed for the project record.

SDG D8D040210: The sample receipt form answered "No" to whether the custody seals present/intact on cooler and/or containers.

SDG D8D210122: There were changes to the body of the chain of custody without initials for page 1

SDG D8D210122: There were changes to the body of the chain of custody without initials for page 1and two; no received information on page 2 of chain of custody.

The Sample Receipt Checklist stated that the following Canister IDs were incorrectly listed on the COC and what they should be:

SDG	COC	Should Be
D8D250300	52742	04186
	61861	11369
	64340	12522
	63872	12185
	64867	93219
D8D210122	52727	04165
	2972	02792
	64208	92068
	4337	04337

Continuing Calibrations:
This is evaluated from available Case Narrative information.

SDG D8D040210, calibration date 4/24/08: 1,2,4-trichlorobenzene > 30% D; chloroethane > 40% D.
No targets are detected, and no qualifiers are added.

SDG D8A210123, calibration date 1/30/08: dichlorodifluoromethane > 30% D.
Associated detections are qualified as JC, since the specific %D is not provided by the laboratory.

Laboratory Control Samples:
One LCS run had an outlier for 1,2,4-trichlorobenzene on the low side. In such cases, the target impacted is qualified in all samples associated with the batch as JL#, where # is the recovery observed. Such results may be biased low by approximately amount of the recovery observed.
In another batch, dichlorodifluoromethane is recovered high, and has associated detections. These detections are qualified JL# and may be biased high.

Method Blanks:

Methylene chloride is detected below the reporting limit in a number of method blanks. For methylene chloride, results are qualified when the sample is less than 10x the dilution-corrected blank level, since this compound is a common laboratory contaminant.

TCE was detected in one method blank at a level below the reporting limit. Associated samples are higher than 5x the dilution-corrected method blank level, so no qualifiers are added.

Data qualified as UB or UB# are usable as nondetected values, with the reporting limit adjusted for such samples at the level of the result observed.

Field Duplicates:

Three field duplicates were identified, as shown in the table within the report. Most targets meet criteria, a few are outside of these limits.

ORGANIC AIR QUALITY REPORT
METHOD TO-15

SDG: D8H150287, D8G170286, DHG180218

PROJECT: Memphis Defense Depot Soil Vapor for e2m, Texas

LABORATORY: TestAmerica, Denver Colorado, subcontracted to TestAmerica Knoxville

SAMPLE MATRIX: Air

SAMPLING DATE (Month/Year): July, August 2008

NUMBER OF SAMPLES: 31 air samples

ANALYSES REQUESTED: Summa Canister VOA TO-15

SAMPLE NO.: Samples attached

DATA REVIEWER: John and Sammy Huntington

QA REVIEWER: Diane Short & Associates, Inc. INITIALS/DATE: _____

Telephone Logs included Yes____ No __X__

Contractual Violations Yes____ No __X_

The EPA CLP National Functional Guidelines for Organic Data Review, 1999 (SOP), EPA Method TO-15 current updates have been referenced by the reviewer to perform this data validation review. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of the e2m Project Manager. Per the Scope of Work, the review of these samples includes validation of all QC forms referencing the QC limits in the above documents.

DELIVERABLES
All deliverables were present as specified in the Statement of Work (SOW) or in the project contract.
Yes _X_ No _ __
Calibration data was not present in the hard copy but was provided in pdf reports included with the EDD.

II. ANALYTICAL REPORT FORMS
A. The Analytical Report or Data Sheets are present and complete for all requested analyses.
Yes __X__ No___

B. Holding Times
The contract holding times were met for all analyses (Time of sample receipt to time of analysis (VOA) or extraction and from extraction to analysis). Contract holding times for TO-15 canisters is 30 days from date of collection.
Yes __X___ No____

C. Chains of Custody
Chains of Custody were present and were complete with signatures, sign-offs and complete entry of data. Canisters were properly sampled and received.
Yes __X___ No __ ___
Note:
All SDGs had a gap in time between relinquished and received that was verified by the FedEx air bill number, per proper procedures.

For SDG D8G170286, sample FSVE-SVE-A-3Q08 was received with water in the can and the analysis was cancelled by the e2m project manager. The sample was re-taken and submitted under SDG D8H150287. This has been properly recorded in the data package.

The project manager is informed of the following and the chains are being completed for the project record.

The Sample Receipt Checklist stated that the following Canister IDs were incorrectly listed on the COC and what they should be for SDG D8G180218:

SDG	COC	Should Be
D8G180218	VMP5A (100236)	11416
	DUP3 (52754)	04192
	VMP9A (0719)	0179
	VMP9B (2643)	6633

D. Canister Pressure
Canister pressures were measured and recorded for initial vacuum check, initial field vacuum, final field reading, lab initial pressure and final pressure.
Yes _____ No _____ NA ___X_____
Not part of this review level.

All readings met the limits or exceptions were noted and pressure corrected
Yes _____ No ____ NA __X__
Not part of this review level.

III. INSTRUMENT CALIBRATION
Case Narratives provide a statement indicating those targets that are outside the 30% D window in the continuing and initial calibrations.

A. Initial Calibration – GC/MS
1. The Relative Response Factors (RRF) and average RRF for all compounds for all analyses met the required criteria.
Yes __X__ No____ NA____
Minimum response factors are not defined by the method. This method does not involve purging water samples. Consequently, all targets, including the typically poor-purging compounds, normally have response factors that are acceptable per validation criteria for volatiles.

The relative standard deviation (RSD) for the five-point calibration was within the 30% limit.
Yes ____ No __X__
SDG D8H150287: All RSDs were within 30%. Hexachlorobutadiene had an RSD of exactly 30% but is considered acceptable.
SDGs D8G170286 and D8G180218: 1,2-dichlorobenzene had an RSD of 30.3%. There are no observed detections of this analyte and no qualifiers are applied.

B. Continuing Calibration – GC/MS
1. The RRF standard was analyzed for each analysis at the required frequency and the QC criteria were met
Yes __X__ No____ NA____
Minimum response factors are not defined by the method, but met validation guidance.

2. The percent difference (%D) limits were met.
Yes ____ No __X__
D8H150287: Chloromethane had a %D of 37%, with a high bias. No qualifiers are added since the compound is not detected in the sample.

D8G180218 and D8G170286: A number of targets are out of limits in the calibration run 7/30/2008, but this calibration was used for only one target, 1,1,2,2-tetrachloroethane. This compound is in control and no qualifiers have been added.

All other CCVs are in control.

IV. GC/MS INSTRUMENT PERFORMANCE CHECK
A. The BFB performance check was injected once at the beginning of each 12-hour period and relative abundance criteria for the ions were met.
Yes _____ No____ NA __X__
Not part of this review level.

V. INTERNAL STANDARDS
A. Area Limits
The Internal Standards met the 100% upper and -50% lower limits criteria and the Retention times were within the required windows.
Yes _____ No____ NA __X__
Not part of this review level.

B. Retention Times
The relative retention times of the internal standards and sample compounds met the $\pm$ 0.06 RRT units limit.

Yes _____ No____ NA __X__
Not part of this review level.

VI. SURROGATE
Surrogate spikes were analyzed with every sample.
Yes __X___ No ____

And met the recovery limits defined in the current contract
Yes ___ No __X__
The laboratory case narratives for D8G180218 and D8G170286 indicate that the daily response factor was used for the calculation of surrogate recoveries in batch 8213128. This batch is the run conducted on 7/30/2008 for the purpose of quantifying high levels of 1,1,2,2-tetrachloroethane. The batch contains three samples, FSVE-SVE-C-3Q08, FSVE-VMP6A-3Q08, and FSVE-DUP2-3Q08. The CCV data show that the surrogates had drifted out of calibration for this run. The only target quantified in the run has an acceptable drift. If the surrogates were quantified using the initial calibration they would produce recoveries that are out of limits, but this is not likely to be reflective of an actual bias on the target compound.

It is apparent that if the target had also been calculated using the daily response factor the result would not be significantly different from that produced using the initial calibration. Therefore no qualifiers are added.

VII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE
A. Matrix spike (MS) and matrix spike duplicates (MSD) were analyzed for every analysis performed and for every 20 samples or for every matrix whichever is more frequent.
Yes____ No ____NA ___X__
Spikes are not amenable to canister analysis and are not required. Laboratory duplicates are required and are provided by the laboratory.
Laboratory Duplicates were conducted on four samples.

B. The MD relative percent differences (RPD) were within the defined contract limits. Method requirements are 25% maximum RPD.
Yes __X__ No ____ NA____
For validation purposes, only results > 5x PQL are qualified for RPD outliers. For results < 5x PQL, results are qualified if the absolute difference is greater than 2x PQL. The qualifier added is JD#, where # is the RPD or the absolute difference observed, as appropriate. No qualifiers are added.

SDG	Client Sample	Lab Sample ID	Outliers	Qualifiers
D8G170286	FSVE-VMP2A-3Q08 DUP	D8G170286010X	None	None
D8G180218	FSVE-VMP1B-3Q08 DUP	D8G180218002X	None	None
D8G180218	FSVE-VMP6A-3Q08 DUP	D8G180218008X	None	None
D8H150287	FSVE-SVEA-3Q08 DUP	D8H150287001X	None	None

VIII. DUPLICATE CONTROL SAMPLES
A. Duplicate Control and Duplicate Control Sample Duplicates similar to Laboratory Control Samples (LCS) were performed for every set.
Yes _X_ No___

B. And percent recoveries were acceptable at 70 – 130%.
Yes ____ No __X_

One check sample had an elevated recovery of chloromethane. This indicates a high bias, but since the compound is not detected no qualifier is added.

SDG	Batch	Analyte	Recovery Outlier	Qualifier
D8G170286	8205076	All OK		None
D8G170286	8213128	All OK		None
D8G180218	8205076	All OK		None
D8G180218	8207084	All OK		None
D8G180218	8213128	All OK		None
D8H150287	8235078	Chloromethane	137	

C. And Relative Percent Differences were within lab limits.
Yes ___ No____ NA__X__
The laboratory does not perform LCS duplicates.

IX. SHIFT CHECKS
Shift checks were performed and were within time limits.
Yes __X__ No____

X. BLANKS
A. Method Blanks were analyzed at the required frequency and for each matrix and analysis.
Yes __X___ No____
This is a nitrogen blank run with each set.

B. The method blank was free of contamination.
Yes _____ No __X___
Methylene chloride is detected below the reporting limit in a number of method blanks. For methylene chloride, results are qualified when the sample is less than 10x the dilution-corrected blank level, since this compound is a common laboratory contaminant.

Data qualified as UB# , where # is the value of the associated blank. Data are usable as nondetected values, with the reporting limit adjusted for such samples at the level of the result observed. The table below summarizes the qualifiers added for method blank contamination.

SDG	Client Sample ID	Lab Sample ID	Target	Result	Flag	Qualifier
D8G170286	FSVE-SVE-B-3Q08	D8G170286002	Methylene chloride	1.5	F B	UB1.7
D8G170286	FSVE-SVE-C-3Q08	D8G170286003	Methylene chloride	31	F B	UB49
D8G170286	FSVE-SVE-D-3Q08	D8G170286004	Methylene chloride	210	F B	UB207
D8G170286	FSVE-SVE-E-3Q08	D8G170286005	Methylene chloride	1.4	F B	UB1.7
D8G170286	FSVE-SVE-F-3Q08	D8G170286006	Methylene chloride	1.9	F B	UB1.7
D8G170286	FSVE-SVE-G-3Q08	D8G170286007	Methylene chloride	31	B	UB4
D8G170286	FSVE-INF-3Q08	D8G170286008	Methylene chloride	77	F B	UB52
D8G170286	FSVE-DUP1-3Q08	D8G170286009	Methylene chloride	730	B	UB156.7
D8G170286	FSVE-VMP2A-3Q08	D8G170286010	Methylene chloride	8.1	F B	UB6.6
D8G170286	FSVE-VMP2B-3Q08	D8G170286011	Methylene chloride	3600	F B	UB4543.7

SDG	Client Sample ID	Lab Sample ID	Target	Result	Flag	Qualifier
D8G170286	FSVE-VMP3A-3Q08	D8G170286012	Methylene chloride	6.2	F B	UB6.2
D8G170286	FSVE-VMP3B-3Q08	D8G170286013	Methylene chloride	2500	F B	UB2851.9
D8G180218	FSVE-VMP1A-3Q08	D8G180218001	Methylene chloride	2	F B	UB1.7
D8G180218	FSVE-VMP1B-3Q08	D8G180218002	Methylene chloride	2.9	F B	UB1.7
D8G180218	FSVE-VMP4A-3Q08	D8G180218003	Methylene chloride	2.5	F B	UB1.7
D8G180218	FSVE-VMP4B-3Q08	D8G180218004	Methylene chloride	12	F B	UB12.8
D8G180218	FSVE-VMP5A-3Q08	D8G180218005	Methylene chloride	2.7	F B	UB1.7
D8G180218	FSVE-DUP3-3Q08	D8G180218006	Methylene chloride	2.2	F B	UB1.7
D8G180218	FSVE-VMP5B-3Q08	D8G180218007	Methylene chloride	1900	F B	UB2423.9
D8G180218	FSVE-VMP6A-3Q08	D8G180218008	Methylene chloride	2.3	F B	UB4.8
D8G180218	FSVE-VMP6B-3Q08	D8G180218009	Methylene chloride	1400	F B	UB2501
D8G180218	FSVE-VMP7A-3Q08	D8G180218010	Methylene chloride	1.4	F B	UB2.2
D8G180218	FSVE-DUP2-3Q08	D8G180218011	Methylene chloride	6600	F B	UB17386.7
D8G180218	FSVE-VMP10B-3Q08	D8G180218012	Methylene chloride	67	F B	UB68.8
D8G180218	FSVE-VMP7B-3Q08	D8G180218013	Methylene chloride	7.8	F B	UB10.6
D8G180218	FSVE-VMP8A-3Q08	D8G180218014	Methylene chloride	1.9	F B	UB1.7
D8G180218	FSVE-VMP8B-3Q08	D8G180218015	Methylene chloride	22	F B	UB54.7
D8G180218	FSVE-VMP9A-3Q08	D8G180218016	Methylene chloride	4	F B	UB8.6
D8G180218	FSVE-VMP9B-3Q08	D8G180218017	Methylene chloride	3.5	F B	UB3.09
D8G180218	FSVE-VMP10A-3Q08	D8G180218018	Methylene chloride	1.8	F B	UB1.7
D8H150287	FSVE-SVEA-3Q08	D8H150287001	Methylene chloride	3.2	F B	UB3.7

C. If Field Blanks were identified, they were free of contamination.
Yes _____ No ____ NA ___X___
There were no field blanks identified.

D. Contamination level was less than 0.03 mg/cubic meter before samples were analyzed per the method.
Yes ____ No____ NA ____X___
Not part of this review level.

XI. FIELD QC
A. If Field duplicates or Performance Check Compounds were identified, they met the RPD or % recovery criteria for the project.
Yes ___ No __X__ NA___
Qualifiers are not added for field duplicate differences. Observations are provided in the table below. When results are > 5x the reporting limit, a 35% RPD is used to identify potential deviations. When results are < 5x the reporting limit, an absolute difference between the results that is < 2x PQL is considered to be acceptable reproducibility.

Three field duplicates were identified, as shown in the table below. Most targets meet criteria, two are outside of the limits in one field duplicate.

SDG	SAMPLE	FIELD DUP	OBSERVATIONS
D8G170286	FSVE-SVE-D-3Q08	FSVE-DUP1-3Q08	OK
D8G180218	FSVE-VMP6B-3Q08	FSVE-DUP2-3Q08	1,1,2,2-tetrachloroethane RPD = 105; tetrachloroethene RPD=50%
D8G180218	FSVE-VMP5A-3Q08	FSVE-DUP3-3Q08	OK

XII. SYSTEM PERFORMANCE
The RICs, chromatograms, tunes and general system performance were acceptable for all instruments and analytical systems
Yes ___ No ____NA__X___
Not part of this review level.

XIII. TCL COMPOUNDS
A. The identification is accurate and all retention times, library spectra and reconstructed ion chromatograms (RIC) were evaluated for all detected compounds:
For this project, ten percent of the data are fully review for chromatograms and spectra.
Yes ___ No____ NA__X_
Not part of this review level.

B. Quantitation was checked to determine the accuracy of calculations for representative compounds in each internal standard set
Yes___ No ____ NA___X__
Not part of this review level.

OVERALL ASSESSMENT
Data are considered to be usable for project purposes after consideration of qualifiers. Points of significance are summarized below:

Deliverables:
Calibration data was not present in the hard copy but was provided in pdf reports included with the EDD.

Chain of Custody:
Note:
All SDGs had a gap in time between relinquished and received that was verified by the FedEx air bill number, per proper procedures.

For SDG D8G170286, sample FSVE-SVE-A-3Q08 was received with water in the can and the analysis was cancelled by the e2m project manager. The sample was re-taken and submitted under SDG D8H150287. This has been properly recorded in the data package.

The project manager is informed of the following and the chains are being completed for the project record.

Some canister IDs were incorrectly listed on the chain of custody in SDG D8G180218. Please see the body of this report for details.

Initial Calibrations:
SDG D8H150287: All RSDs were within 30%. Hexachlorobutadiene had an RSD of exactly 30% but is considered acceptable.

SDGs D8G170286 and D8G180218: 1,2-dichlorobenzene had an RSD of 30.3%. There are no observed detections of this analyte and no qualifiers are applied.

Continuing Calibrations:
D8H150287: Chloromethane had a %D of 37%, with a high bias. No qualifiers are added since the compound is not detected in the sample.

D8G180218 and D8G170286: A number of targets are out of limits in the calibration run 7/30/2008, but this calibration was used for only one target, 1,1,2,2-tetrachloroethane. This compound is in control and no qualifiers have been added.

All other CCVs are in control.

Surrogate Recoveries:
The laboratory case narratives for D8G180218 and D8G170286 indicate that the daily response factor was used for the calculation of surrogate recoveries in batch 8213128. This batch is the run conducted on 7/30/2008 for the purpose of quantifying high levels of 1,1,2,2-tetrachloroethane. The batch contains three samples, FSVE-SVE-C-3Q08, FSVE-VMP6A-3Q08, and FSVE-DUP2-3Q08. The CCV data show that the surrogates had drifted out of calibration for this run. The only target quantified in the run has an acceptable drift. If the surrogates were quantified using the initial calibration they would produce recoveries that are out of limits, but this is not likely to be reflective of an actual bias on the target compound.

It is apparent that if the target had also been calculated using the daily response factor the result would not be significantly different from that produced using the initial calibration. Therefore no qualifiers are added.

Laboratory Control Samples:
One check sample had an elevated recovery of chloromethane. This indicates a high bias, but since the compound is not detected no qualifier is added.

Method Blanks:
Methylene chloride is detected below the reporting limit in a number of method blanks. For methylene chloride, results are qualified when the sample is less than 10x the dilution-corrected blank level, since this compound is a common laboratory contaminant.

Data qualified as UB# are usable as nondetected values, with the reporting limit adjusted for such samples at the level of the result observed. The table within the body of this report summarizes the qualifiers added for method blank contamination.

Field Duplicates:
Three field duplicates were identified, as shown in the table within the body of this report. Most targets meet criteria, two are outside of these limits in one of the field duplicates.